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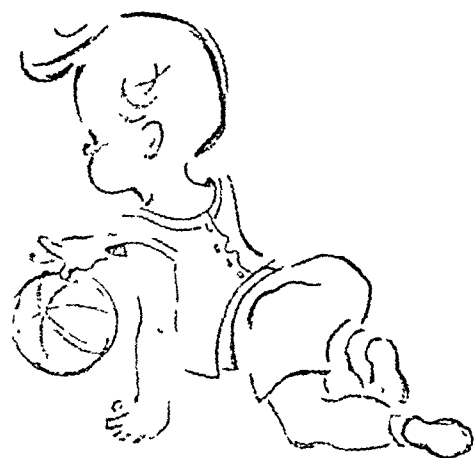
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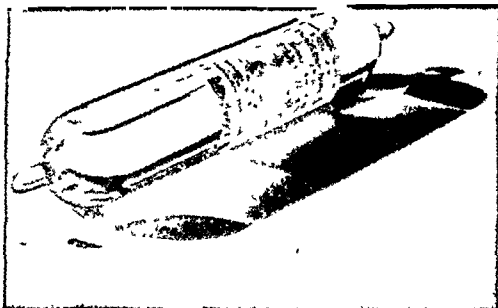
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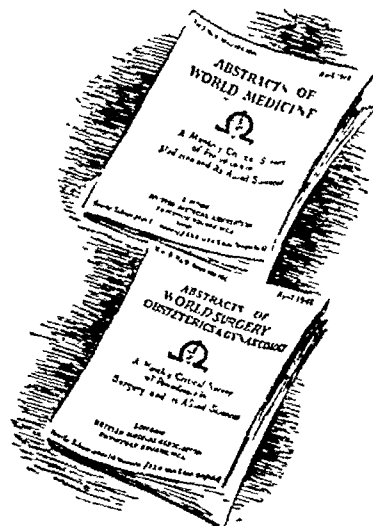
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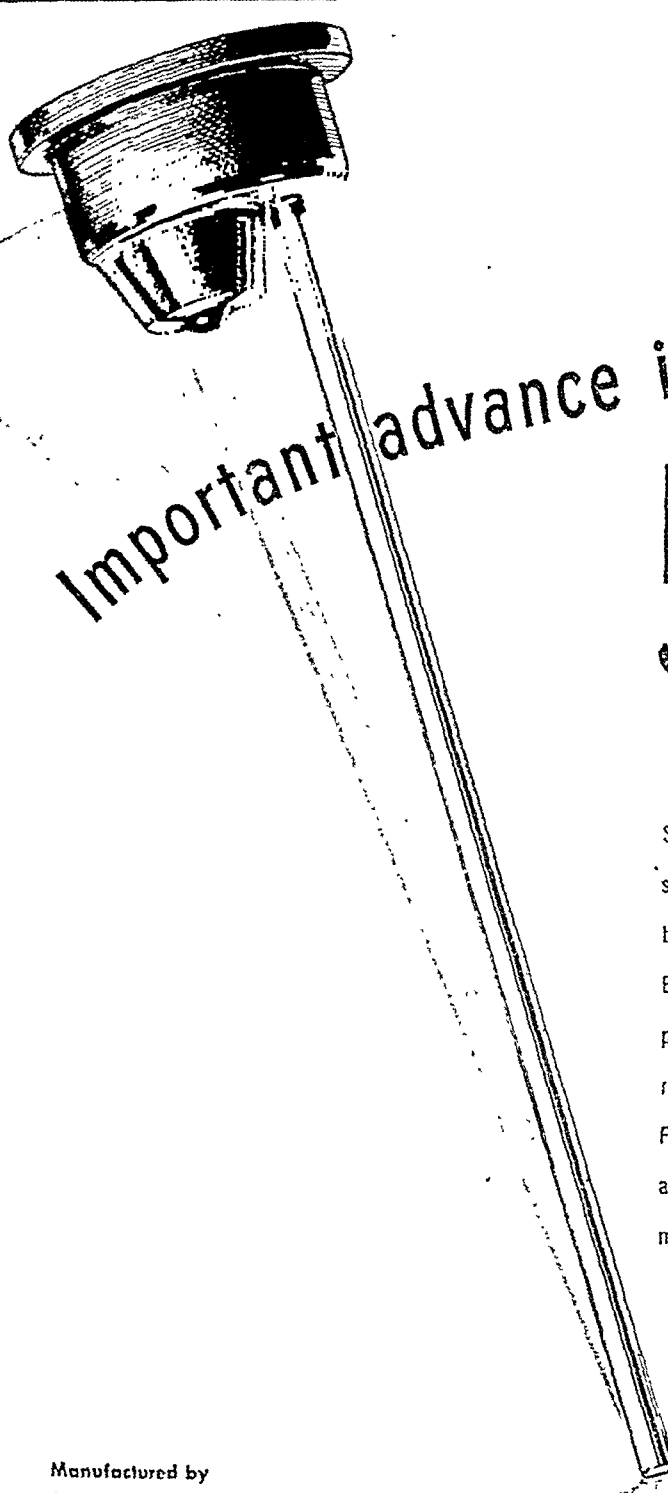
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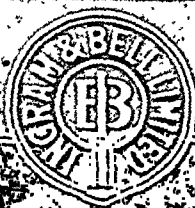
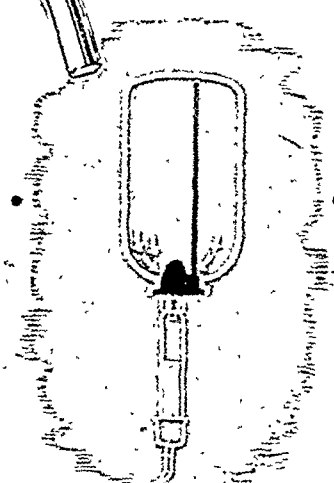
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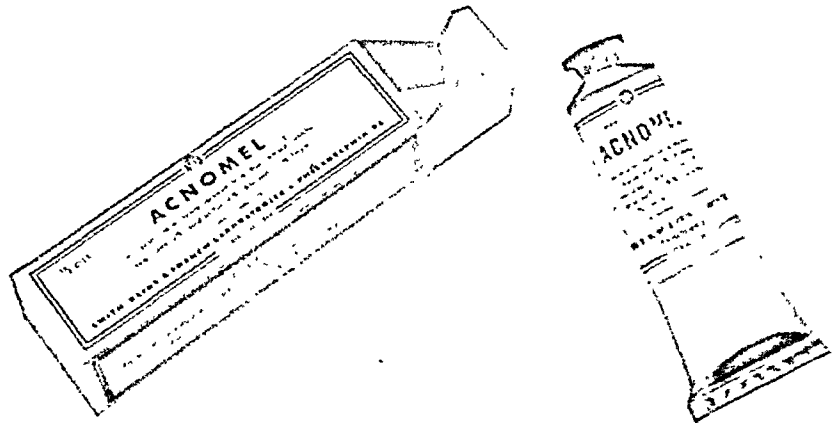
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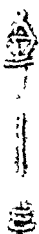
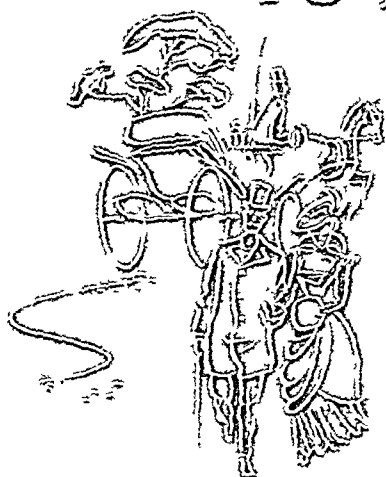
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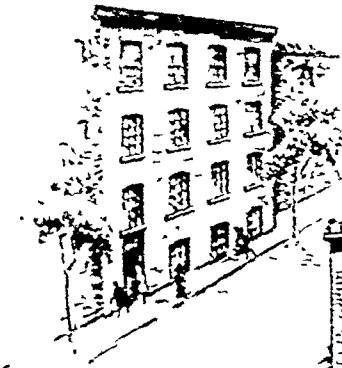
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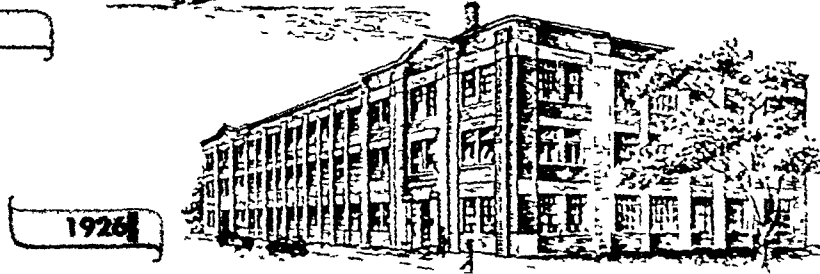
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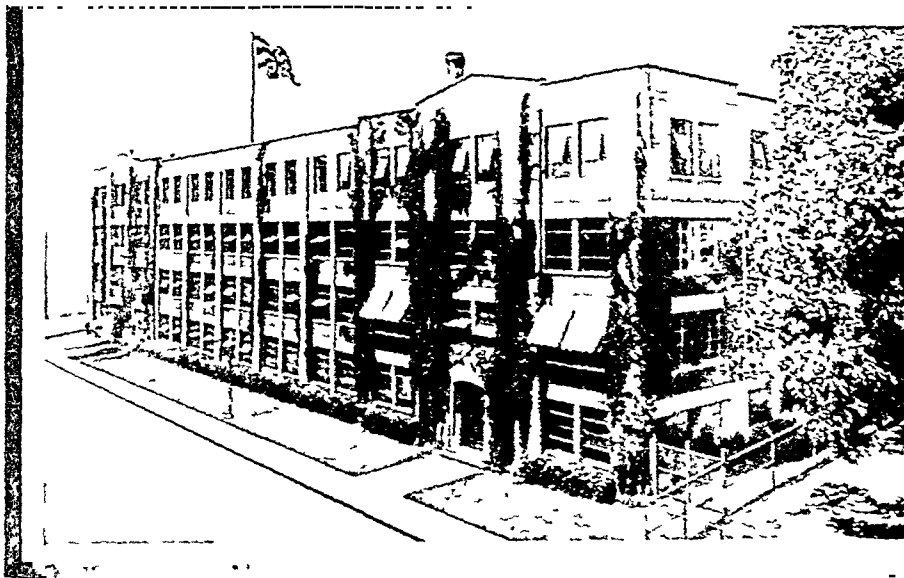
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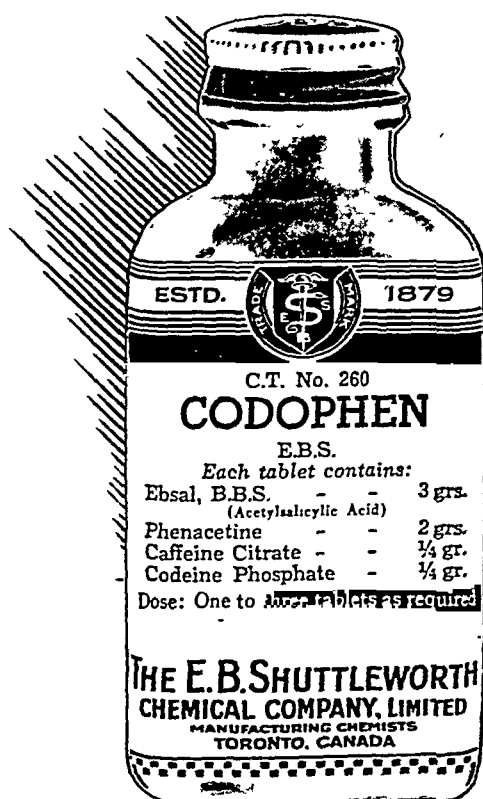
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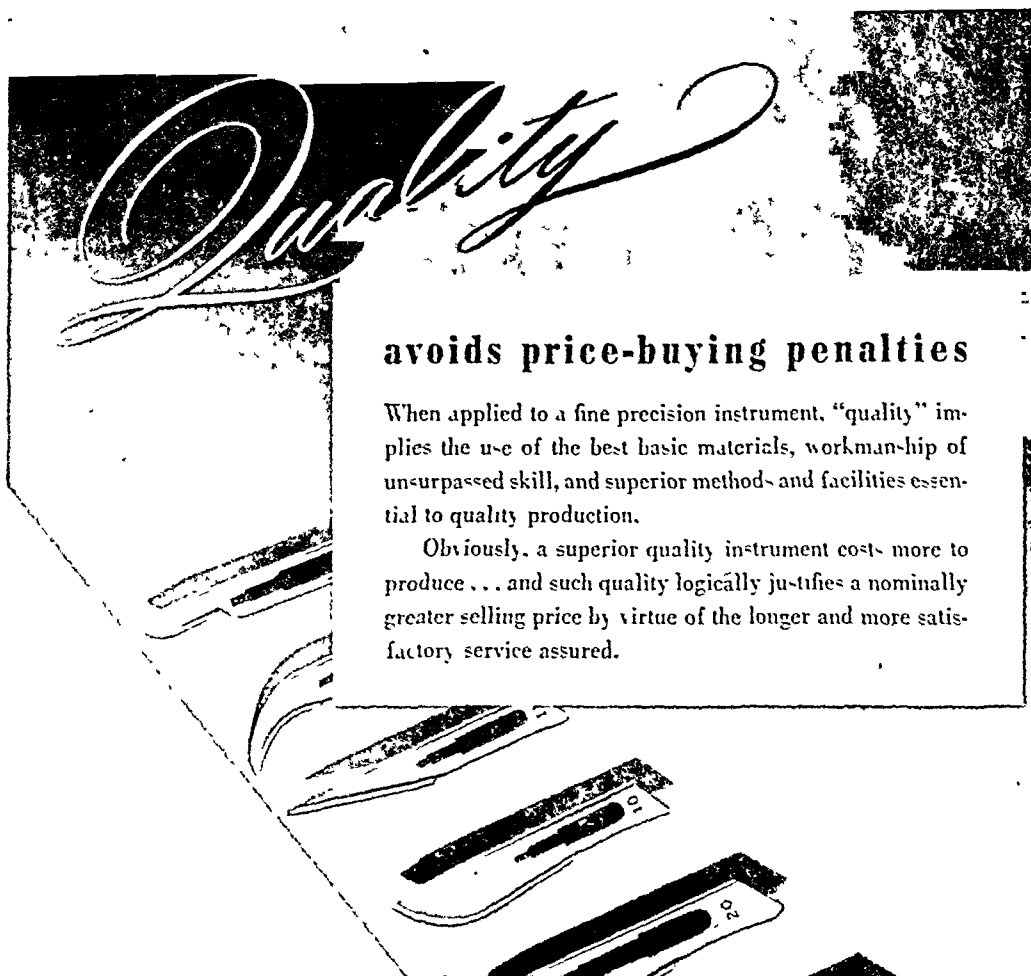
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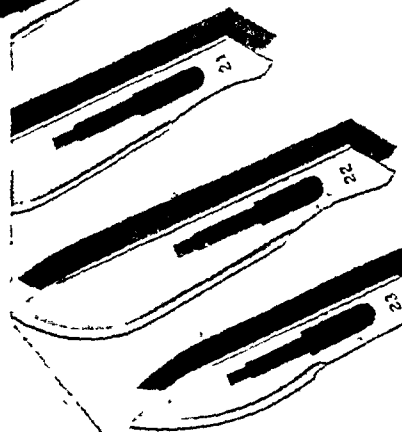
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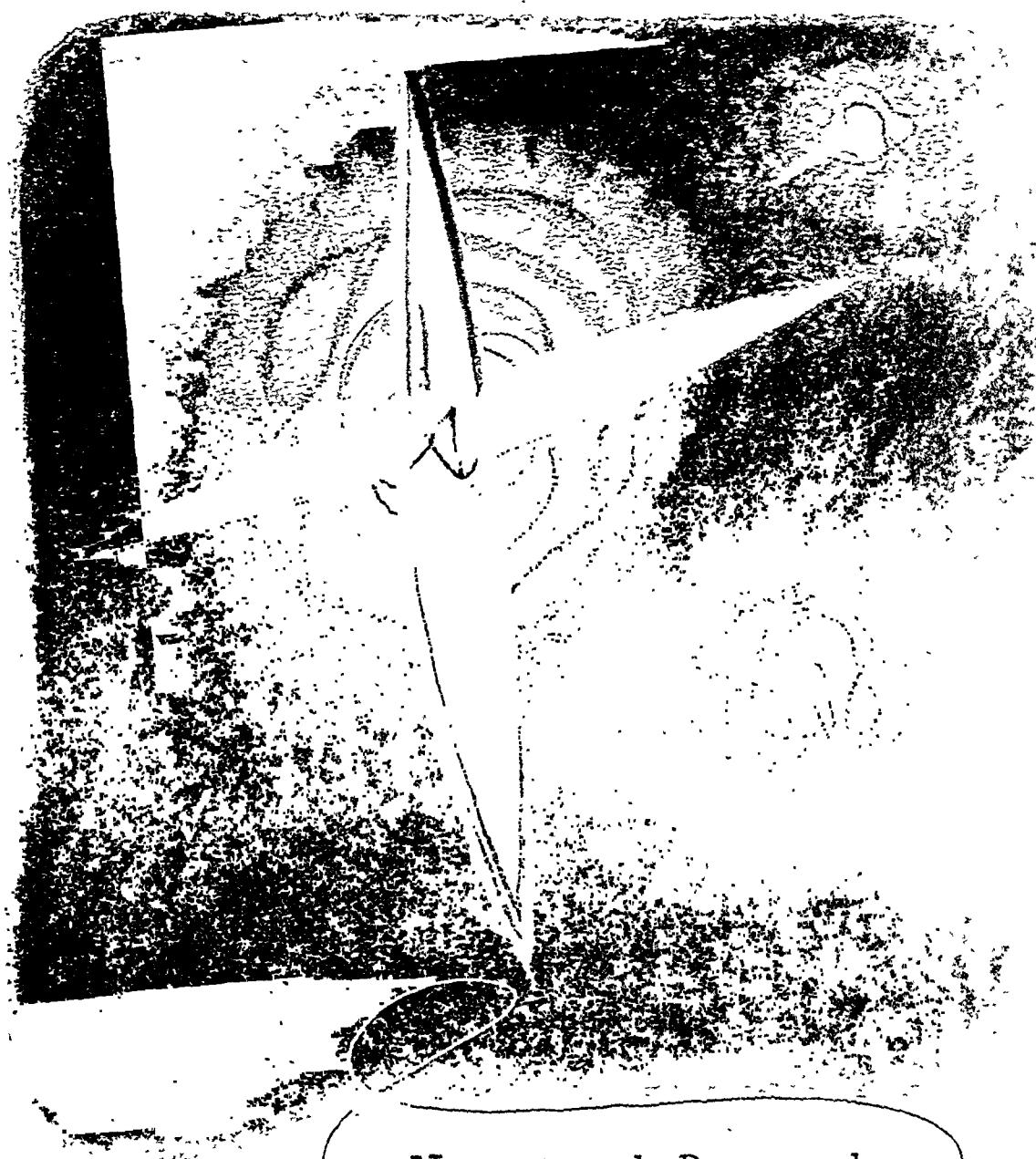
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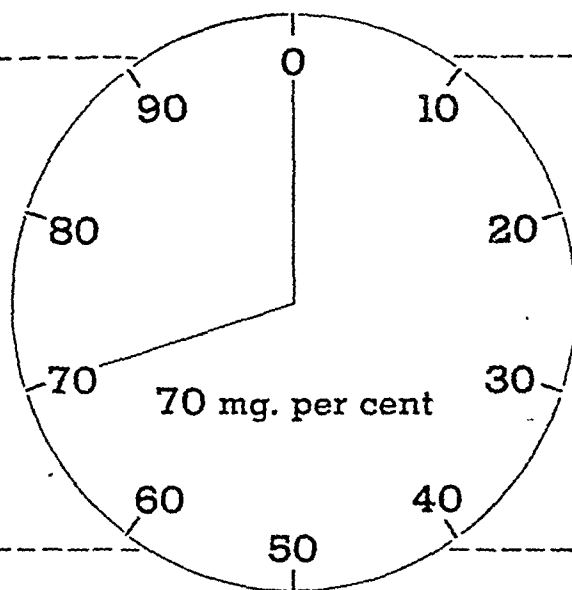
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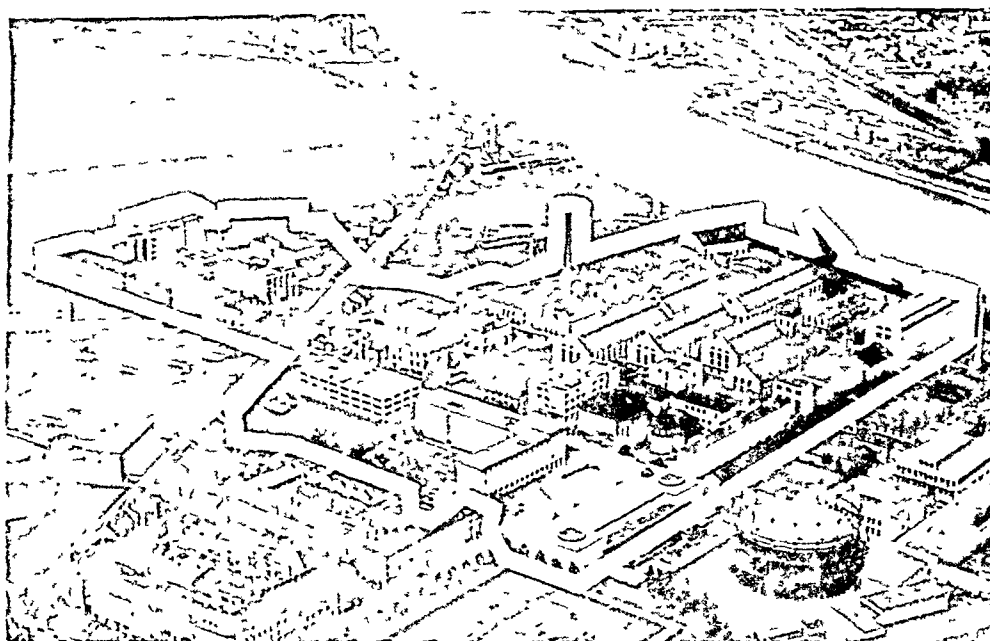
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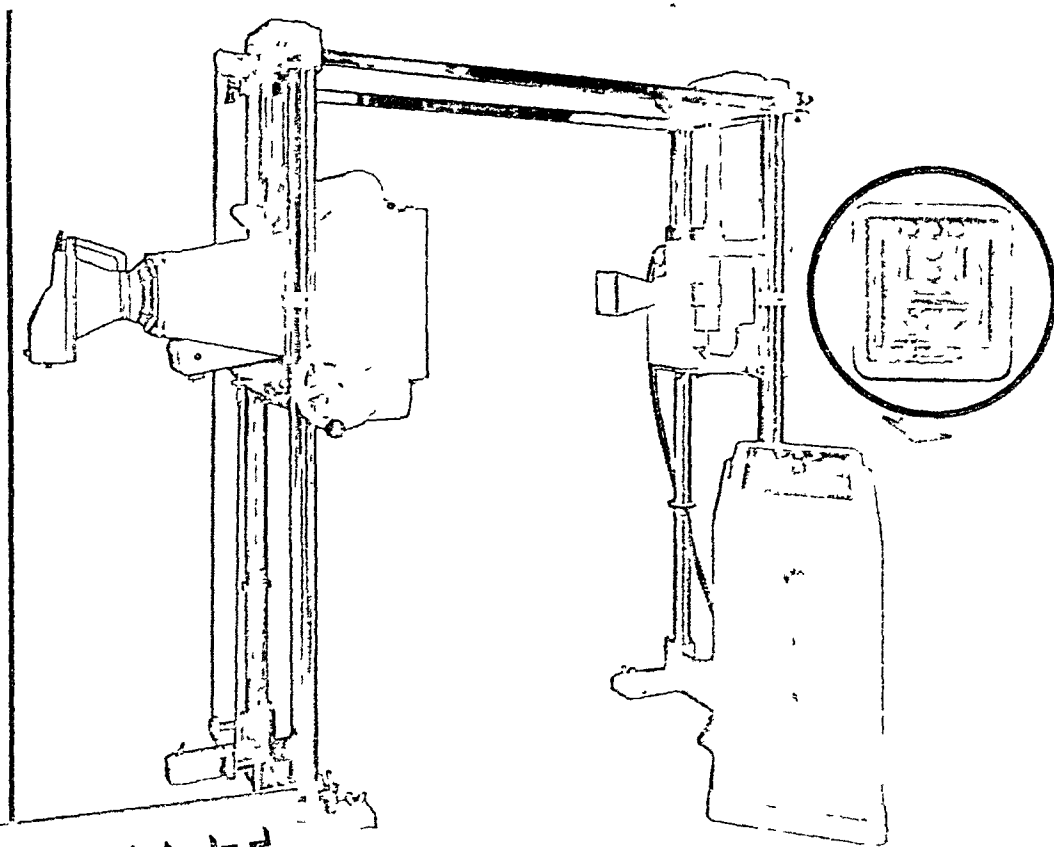
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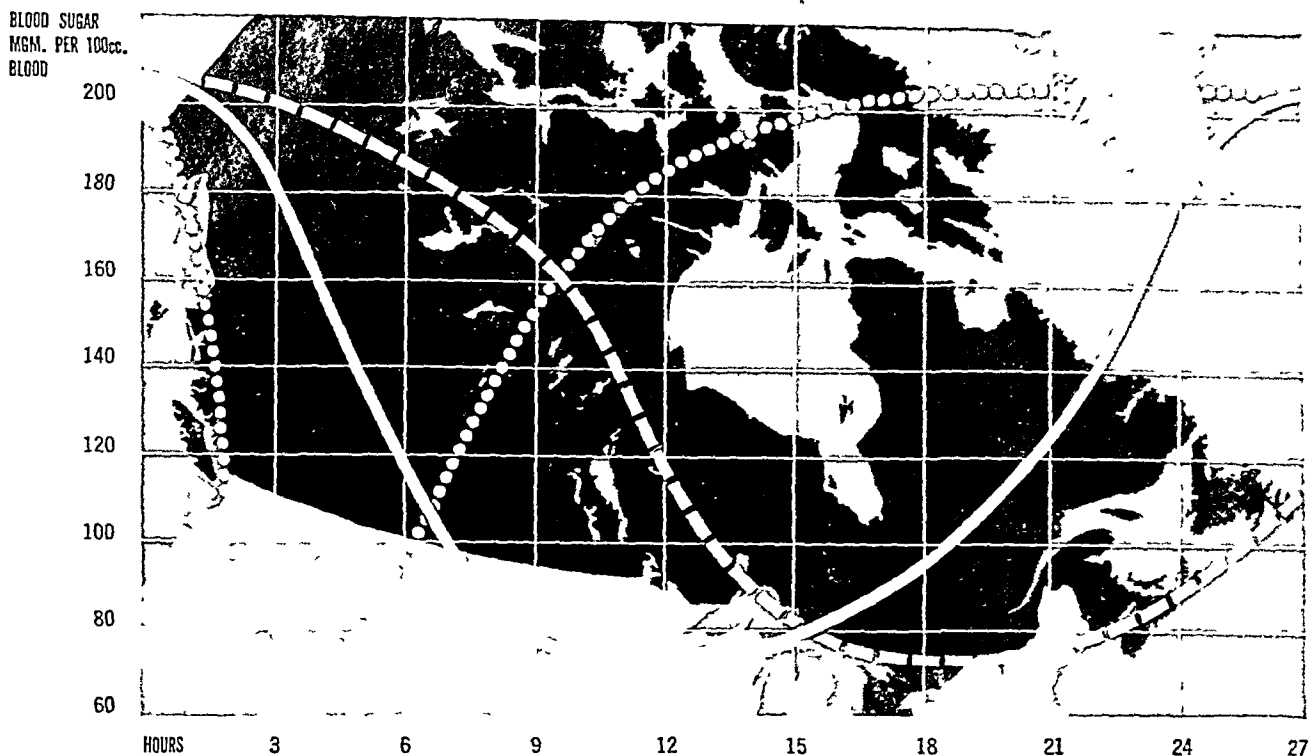
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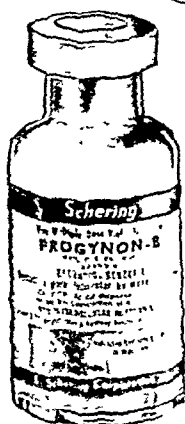
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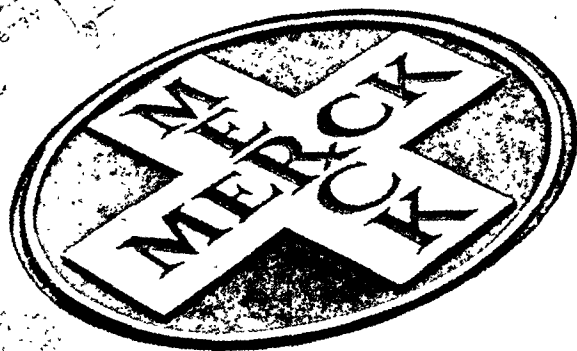
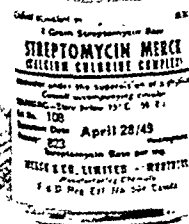
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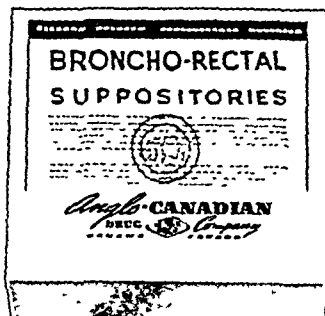
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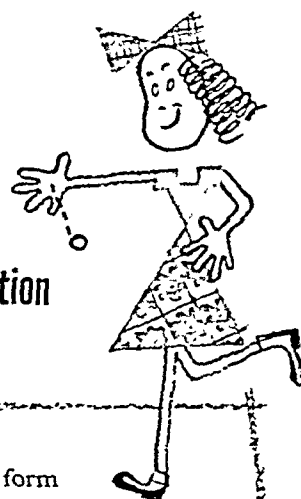
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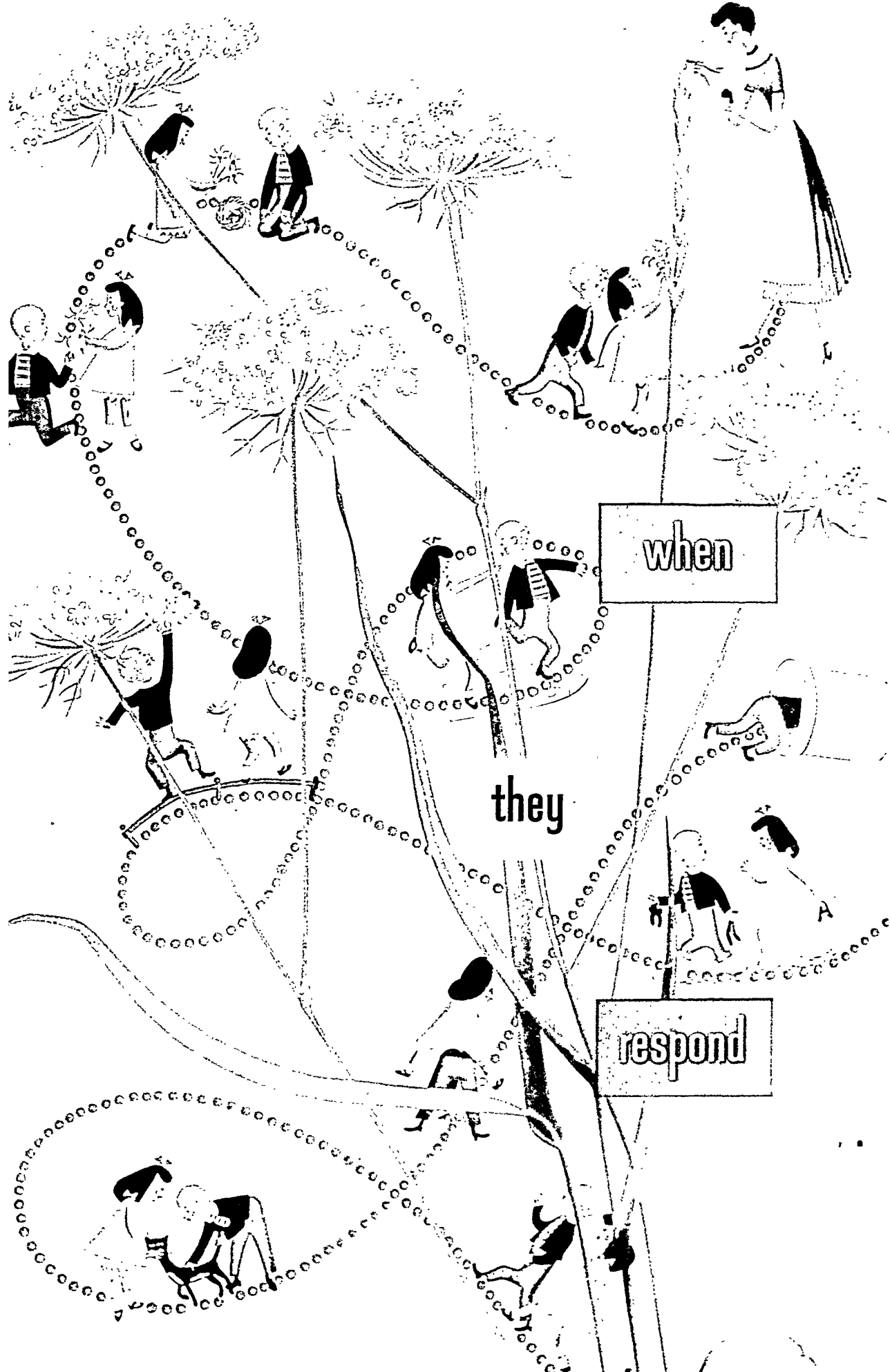


*\*J.A.M.A. June 26,  
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# The Canadian Medical Association Journal

Vol. 60

JANUARY, 1949

No. 1

## PLASTER OF PARIS AS A SOURCE OF INFECTION IN TETANUS AND GAS-GANGRENE\*

E. G. D. Murray, F.R.S.C. and  
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FATAL tetanus developed in a case following an elective operation on a tuberculous knee joint. The operation, on December 23, 1947, was an arthrodesis with application of a plaster cast from foot to thigh, and a specimen from the knee, at the time of operation, yielded only *Mycobacterium tuberculosis* on culture and guinea pig inoculation. On January 9, 1948, evidence of infection of the wound was noticed, but no specimen was sent for bacteriological examination until January 22, when signs and symptoms of tetanus were recognized. *Clostridium tetani* was found in the wound exudate, together with *Pseudomonas aeruginosa*, *Aerobacter aerogenes* and an anaerobic streptococcus which died out before its identification was completed. The patient died the next day.

The strain of *Cl. tetani* isolated from the wound before death was characteristic in every way and produced fatal tetanus in an unprotected guinea pig, while an animal protected with anti-tetanus serum remained unaffected. Material from the surgical wound post mortem gave profuse growth of *Cl. tetani*, *Cl. perfringens* and *Pseudomonas aeruginosa*.

### SOURCE OF INFECTION

As there was no possible interpretation of these findings other than a hospital infection, it was a matter of prime importance to discover the source of contamination. Faeces of the patient were collected from the bowel at the autopsy but meticulous examination failed to isolate *Cl. tetani*. Therefore faecal soiling of a bedridden patient could not be considered the source of infection.

Unfortunately the original plaster and dressings were removed on January 9, when the first

infection was noticed and were discarded without being submitted for examination. These were replaced on that date by a second plaster with a window to facilitate dressings, but this could not be examined either as it had been removed and destroyed. There was no record of the batch number of the plaster bandages used on the patient and there were no bandages left in the operating room, the ward, or the store room, approximating to the date of the operation or of changing the cast on the patient. The store room had only a fresh consignment of plaster bandages but they were of the same make as those used on the case.

The first bandage examined was cultured direct from its original sealed tin and it yielded *Escherichia coli*, two species of *Bacillus* (aerobic spore formers) not further identified, *Streptococcus faecalis*, *Cl. perfringens* and *Cl. bifermens* of the toxic Sordelli type. This clearly indicated the serious possibility of the plaster being the source of infection.

A second bandage, besides moulds and at least two kinds of *Bacillus* and a *Clostridium*, which was not identified further, yielded *Cl. tetani* which was proved by guinea pig inoculation and antitoxin protection as well as by cultural characters and morphology. *Cl. tetani* was recovered from as small a piece as two square inches of this bandage.

This result indicates clearly that the plaster bandages can be a source of gas-gangrene and tetanus infection and it is justifiable to infer that the plaster was the source in this case. Enquiry reveals that plaster bandages are never sterilized before use in the hospital and it is improbable that any other hospital does so, even when they are used in the Trueta method on open wounds.

Following these findings, twenty-eight bandages in their original containers and wrappings, representing batches made in the years 1945, 1946, 1947 and 1948 were examined by culturing the entire bandage. There is no significant distinction for any particular year indicated by the kind and distribution of organisms cultured

and shown in the attached Table. *Cl. tetani* was not found in any of these bandages but had been found in another bandage. *Cl. perfringens* was present in 24, and of those lacking the Welch bacillus only one had not other clostridia. Only one had no anaerobes, and 4 had no aerobes. Two bandages gave pure cultures of *Cl. perfringens* and these were the only samples with

Gas-gangrene was produced in guinea pigs with the strains isolated of *Cl. perfringens*, *Cl. novyi*, *Cl. histolyticum* and *Cl. bifermentans* but not with *Cl. cochlearium* and those clostridia listed as not pathogenic. All cultures of *Bacillus* were carefully examined to be sure that none of them was anthrax, which remains a possible finding in such material as plaster of Paris.

TABLE OF DISTRIBUTION AND KINDS

Samples and year	Aerobes				Anaerobes (clostridium)						No. of different distributed kinds
	Moulds	Bacillus	Str. faecalis	Str. bovis	Perfringens	Novyi	Bifermentans	Histolyticum	Cochlearium	Not pathogenic	
25	10	24	1	2	24	1	4	3	3	6	78
4542	.	.	.	.	1	.	.	.	.	.	1
4548	2	.	1	.	.	.	.	.	1	.	4
4528	.	3	.	.	.	.	1 (S)	.	.	.	4
4624	1	2	.	.	1	.	.	.	1	1	6
4627	1	.	.	.	1	.	.	.	.	.	2
4628	.	1	.	1	1	.	.	1	.	.	4
4630	.	.	.	1	1	.	.	.	.	1	3
4633	.	1	.	.	1	.	.	.	.	.	2
4636	.	1	.	.	1	.	.	.	.	.	2
4637	1	1	.	.	.	.	.	.	.	.	2
4643	.	1	.	.	1	.	.	.	.	.	2
4640	1	.	.	.	1	.	.	.	1	.	3
4717	.	1	.	.	1	.	.	.	.	.	2
4734	.	1	.	.	1	.	.	.	.	.	2
4741	1	.	.	.	1	.	.	.	.	1	3
4750	.	1	.	.	1	.	1	.	.	.	3
4752	2	1	.	.	1	.	.	.	.	.	4
4758	.	1	.	.	1	.	.	.	.	1	3
4801	1	1	.	.	1	1	.	1	.	1	6
4805 A	.	.	.	.	1	.	.	.	.	1	2
4805 B	.	1	.	.	1	.	1	.	.	.	3
4807 A	.	.	.	.	1	.	1	.	.	.	2
4807 B	.	1	.	.	.	.	.	1	.	.	2
4809 A	.	2	.	.	1	.	.	.	.	.	3
4809 B	.	1	.	.	1	.	.	.	.	.	2
4809 C	.	1	.	.	1	.	.	.	.	.	2
4809 D	.	2	.	.	1	.	.	.	.	.	3
4809	.	.	.	.	1	.	.	.	.	.	1

only one kind of organism. Of the four strains listed as *Cl. bifermentans* one was of the highly toxigenic Sordelli type, which was also found in the first bandage examined and not listed in the table.

It is significant that non-sporing organisms of potential pathogenicity and capable of contributing to the establishment of infection were found in the bandages; besides *Streptococcus faecalis* and *Streptococcus bovis* listed in the table, *Escherichia coli* and an unidentified anaerobic streptococcus had been found in other bandages. It is interesting that different packages of the same batch varied markedly in two instances, suggesting an uneven distribution in the gypsum, as might be expected.

#### STERILIZATION

The sterilization of these bandages has occupied our attention, and it presents certain difficulties. They cannot be sterilized in the autoclave because they are spoiled by wetting, even though it is completely effective, and the good insulating properties of gypsum greatly slow the penetration of dry heat to reach an effective temperature. The vacuum seal of the package must be broken to allow of effective heating. Part of a 6 inch by 4 yard bandage was cut-off and proved by culture to contain clostridia and aerobic spore-formers as well as other organisms. The remainder of the bandage was returned to its original single bandage tin, then slowly raised to 200° C. and maintained at

that temperature for 5 minutes. When it had cooled, a liberal sample remained sterile for two weeks of observation of the cultures and the remainder of the bandage made a satisfactory plaster on a piece of wood.

The solution seemed simple, but, although another single package of bandage heated at 200° C. for 5 minutes in the operating room proved sterile, the bandages in an original package of six heated at 200° C. for 10 minutes were not sterile and grew *Cl. perfringens* and *Cl. bifermentans* among others. It was therefore necessary to make more extensive tests.

The original tin containers of 6 bandages, each 6 inches by 3 yards and tightly packed, were heated in an electric hot air oven accurately controlled. The vacuum seal of the packages was broken and the temperature raised slowly, so that the recorded temperature of 200° C. was reached in not less than 28 minutes in one experiment and 47 minutes in the rest. The temperature was then maintained for the desired time, after which the oven was opened and the packages taken out to cool to room temperature as quickly as possible. Each bandage was then cultured in its entirety, or pieces cut from the centre of the roll, with particular note of the central one which was most thoroughly insulated by the other 5 surrounding it closely. There were instances when this central bandage grew less resistant organisms than the others, so position and packaging is of some importance. No bandage in the packages of 6 was sterilized in 10 minutes, 20 minutes and 30 minutes at 200° C.; one bandage was sterilized in 45 minutes, two in 60 minutes, and all six were completely sterile in two hours and three hours. The clostridia were killed in all bandages in 1 hour at 200° C. but the aerobic spore formers (*Bacillus* sp.) survived in 4 bandages for this time, while in shorter times the anaerobes survived in two of the five bandages, showing growth after 45 minutes heating at 200° C. Thus it is evidently much easier to kill the spores of various species of *Clostridium* than those of various species of *Bacillus*.

Single bandages, especially smaller sizes, are much more easily sterilized by heat than packages of bandages, but even so the penetration of the gypsum by heat is slow. Packages of 6 larger bandages required two hours at 200° C. to give complete sterilization and the

bandage is then in good condition. Three hours at 200° C. destroys the fabric holding the plaster of Paris and the bandage is discoloured and too brittle for use. This situation imposes a difficult problem on the manufacturers if they be required to produce sterile bandages, and on the hospitals which make up their own or use ordinary plaster of Paris.

It is not possible to say which of the two plaster casts on the patient was responsible for the infection, as neither could be examined. If in either case the incubation period might appear to be long, this quotation from a review by Trueta (*St. Bartholomew's Hospital Journal*, 52: 16, 1948) suggests a reason for it: "We found that if a highly lethal dose of toxin, like tetanus toxin, was injected into an immobilized limb of a rabbit, this animal would survive for very much longer, some animals for as much as five times longer, than if the injection had been given to a limb which remained mobile. The same happened with some of the snake venoms." This suggests the possibility of accumulation of toxin in a limb under plaster immobilization, with delayed manifestation and grave danger if removal of the plaster effects its sudden release. Such a situation may have contributed certain features to this case, particularly the abrupt onset of the first symptoms, their rapid development, and how quickly death followed.

Closed plaster has proved advantages, but concomitant complete aseptic precautions are none the less essential. Although gas-gangrene in its less severe forms has proved to be manageable by Trueta's method, it is definitely desirable not to risk infection by using contaminated dressings.

Tetanus is a much more dangerous infection. It must be observed that the plaster in use on war wounds involved entirely different circumstances to those prevailing in civilian practice. The armed forces were largely immunized with tetanus toxoid and many received antitoxin as well, if wounded. It is quite possible, too, that many wounds became infected when sterilized plaster was used, but their significance may have been overlooked and the source of infection may not have been recognized, because of the high probability of soiling of war wounds.

Be that as it may, the probability of the plaster cast itself providing the source of in-

fection of wounds has been overlooked until now and the prevailing surgical technique in using plaster provides no protection from it. All that is required is that the gypsum used be completely sterilized, but no thoroughly satisfactory method has yet been devised to do so, and it may not prove an easy problem to solve, especially for plaster bandages. A period of prophylactic use of sulfonamides or antibiotics may give some measure of protection, as may incorporation of bacteriostatic agents in the plaster, but both procedures have disadvantages and the inherent danger of a false sense of security must not be overlooked in their use.

#### SUMMARY

*Clostridium tetani* and accepted gas-gangrene clostridia were isolated from plaster of Paris bandages and this is considered the source of infection in a fatal case of tetanus. The difficulties involved in satisfactory sterilization of plaster of Paris for surgical use is considered. Plaster of Paris as a source of infection of wounds has been overlooked hitherto and it is suggested that it is probably a more common occurrence than is realized.

---

### A BACTERIOLOGICAL ANALYSIS OF PLASTER OF PARIS BANDAGES

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Department of National Health and Welfare,  
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THE following investigation was undertaken as a direct result of a letter received from Professor E. G. D. Murray of McGill University, the substance of which is contained in the preceding paper.

The occurrence of fatal tetanus following an elective operation, the arthrodesis of a previously unopened knee joint, caused Professor Murray to suspect hospital infection. Original specimens from the knee joint at time of operation yielded only *Mycobacterium tuberculosis*, whereas post mortem specimens from the same area showed a variety of organisms including *Cl. tetani*. A plaster of Paris bandage had been used to immobilize the knee following the

operation. In subsequent analysis anaerobic contamination in plaster of Paris bandages was found to be very high. Of 28 bandages tested, 27 were found to have anaerobes; 24 had *Cl. Welchii*, and one *Cl. tetani*. The *Cl. tetani* was isolated from a two square inch portion of a single layer of the bandage.

Because of the serious nature of the McGill findings, a survey on this type of bandage was instigated throughout Canada. Canadian food and drug inspectors across the country were asked to visit hospitals and drug stores in their territory and to procure samples of all types of plaster of Paris bandages. Specimens were obtained from 75 hospitals and 43 commercial distributors; 194 bandages were examined and these represented products from 14 commercial manufacturers and 14 hospitals that made their own bandages.

#### EXPERIMENTAL PROCEDURE

1. *Medium*.—Bacto fluid thioglycollate medium enriched with cooked meat was used. This was put up in gem jar fruit sealers. To accommodate different sized bandages two sizes of jars were used (a) pint jars with 250 c.c. of fluid medium and (b) quart jars containing 500 c.c. In every instance the medium was prepared, autoclaved and cooled to 45° C. immediately before use.

2. *Technique*.—Using aseptic technique, each bandage was carefully unwrapped and deposited in a separate sealer. The lids, lined with gem jar rubber rings, were screwed on tightly to prevent further free air from getting in. When the bandages were too large for either size of jar, a small portion, about 5 or 6 square inches of a single layer, was cut off the bandage with sterilized scissors and transferred to the jars.

The sealers were then incubated at 37° C. for one week. Twenty-four hours after inoculation, subcultures from each specimen were made on two blood agar plates. One plate was incubated aerobically and the other anaerobically in a Brewer's anaerobic jar and both were incubated at 37° C. Colonies on the aerobic plates were classified into groups by their colony form and morphology. In general, little attempt was made to identify the aerobic bacteria into individual species. Of the organisms of the genus *Bacillus*, 5 colony types occurred with greatest frequency. Four of these were identified as belonging to type *B. subtilis*, and the fifth to the

*B. cereus* group. No coagulase positive staphylococci were found.

Colonies from the anaerobic plates were picked to cooked meat medium and incubated at 37° C. for 24 hours. They were then inoculated into diagnostic media in attempt to obtain precise identification. Each anaerobic culture was tested for virulence by inoculation into guinea pigs. Wherever possible, the identification of the virulent organisms was completed by protection tests with specific antitoxin. Seven days after inoculation, a further subculture was made from the original sealers to blood agar plates. These were incubated in an anaerobic jar in attempt to find further anaerobic bacteria.

### RESULTS

One hundred and ninety-four specimens were examined in this survey. Of the 163 specimens from commercial manufacturers, 111 (68%) were found to have anaerobes (see Table I). Of

TABLE I.

SUMMARY OF THE BACTERIOLOGICAL ANALYSIS OF COMMERCIAL PLASTER OF PARIS BANDAGES

Manufacturer No.	No. tested	No. with anaerobes	No. sterile
1 .....	58	52	0
2 .....	52	28	0
3 .....	34	19	0
4 .....	4	3	0
5 .....	1	1	0
6 .....	3	0	0
7 .....	1	1	0
8 .....	3	3	0
9 .....	2	2	0
10 .....	1	0	0
11 .....	1	1	0
12 .....	1	0	0
13 .....	1	1	0
14 .....	1	0	1
Total .....	163	111 (68%)	1

the 31 specimens prepared by the hospitals, 23 (74%) were found to have anaerobes (see Table II). Only one bandage (approximately 1%) was found to be sterile.

Details of the types of organisms found are shown in Table III; 177 (91%) bandages were found to have spore-bearing aerobic bacilli, many specimens having two or more species; 108 bandages (56%) had *Cl. Welchii*, 18 (9%) *Cl. sporogenes*, and 67 (34%) had anaerobes belonging to different species. In the latter group *Cl. novyi* was found in 6, *Cl. Sordellii* in 8, and *Cl. histolyticum* in 8.

### DISCUSSION

The literature is void of articles relating to the bacteriological purity of plaster of Paris bandages. So far as is known, until the work at McGill University was done, little attention has been paid to that particular feature. These bandages have often been placed on wounds, undoubtedly heavily contaminated with bacteria, with apparently no ill results. The danger of actual serious infection from the plaster cast bandage itself, however, should not be ignored, especially in civilian use where the majority are not immunized against tetanus.

TABLE II.

SUMMARY OF THE BACTERIOLOGICAL ANALYSIS OF PLASTER OF PARIS BANDAGES MADE BY INDIVIDUAL HOSPITALS FOR THEIR OWN USE

Hospital	No. tested	No. with anaerobes	No. sterile
1 .....	1	1	0
2 .....	2	1	0
3 .....	1	1	0
4 .....	3	2	0
5 .....	4	1	0
6 .....	1	1	0
7 .....	2	2	0
8 .....	1	1	0
9 .....	2	1	0
10 .....	2	2	0
11 .....	3	2	0
12 .....	3	3	0
13 .....	3	3	0
14 .....	3	2	0
Total .....	31	23 (74%)	0

The results obtained at McGill University, and our own, have shown plaster of Paris bandages to be heavily contaminated with bacteria. In the present study no pathogenic aerobe, nor *Cl. tetani*, was found but this would not necessarily exclude their presence. *Cl. tetani*, in particular, can prove a very fastidious organism and can be very difficult to isolate. Of interest is the fact that no Gram-negative aerobic bacteria were noted.

The bacteriological analysis of 7 samples of plaster of Paris showed that these were heavily contaminated with anaerobes and suggests that this might be the chief source of contamination in the bandages. Sterilization of the bandage can be achieved by dry heat and autoclaving, but care must be exercised with both methods. Where dry heat is used, the bandages must not be held in direct contact with heating surfaces nor must the temperature be allowed to exceed 210° C. or the gauze may char, causing the



TABLE III.  
RESULTS OF THE BACTERIOLOGICAL ANALYSIS OF 194 PLASTER OF PARIS BANDAGES

Manufacturers, No.	Number of samples tested	Aerobes							Anaerobes							Unidentified Cl. (pathogenic to guinea pigs)	Unidentified Cl. (not pathogenic to guinea pigs)
		Bacillus	Diphtheroid	Micrococcus	Cl. Welchii	Cl. sporogenus	Cl. nolyti	Cl. Sordellii	Cl. bifementans	Cl. coelestium	Cl. tertium	Cl. capitans	Cl. tetanomorphum	Cl. lentoputrescens	Cl. histolyticum		
1.	58	56	7	3	45	10	1	5	7	2	3	1	1	1	4	6	14
2.	52	51	6	6	21	5	12	0	3	0	0	0	1	0	1	1	15
3.	34	30	0	10	13	1	1	0	0	0	0	0	0	0	1	0	3
4.	4	4	1	1	2	0	0	0	0	0	1	0	0	0	0	0	0
5.	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
6.	3	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7.	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8.	3	3	0	1	2	2	1	0	0	0	0	1	0	0	1	1	0
9.	2	2	0	1	2	0	0	0	2	0	0	0	0	0	0	0	0
10.	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12.	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
14.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.*	31	24	4	9	20	0	1	2	3	0	0	0	0	0	2	0	0
Total	194	177	18	34	108	18	6	8	15	2	4	1	3	1	8	8	25
%		91	9	18	56	9	3	4	8	1	2	0.5	1.5	0.5	4	4	13.0

\* A compilation of bandages manufactured by the individual hospitals.

bandage to crumble. When autoclaving, if the bandage absorbs too much moisture it will be unusable. For hospitals who prepare their own bandages, sterilizing the ingredients separately may be the solution, for in this way the plaster of Paris can be subjected to high temperatures and the gauze can be autoclaved.

#### STERILIZATION OF PLASTER OF PARIS BANDAGES IN THE OTTAWA CIVIC HOSPITAL (M. O. Klotz, M.D.)<sup>\*</sup>

When drawn to our attention, the significance of this work was self-evident and it was apparent that immediate attempts should be made to prevent "plaster infections" as far as possible. In order to prevent contamination of operating theatres, it was ruled that only plaster preparations rendered bacteriologically sterile should be used in these rooms. It was also ruled that only sterile plaster should be applied to compound fractures or other cases where plaster was to be used over open wounds. From the vast accumulation of past practical experience it would seem reasonable to assume that the bacteriological status of the plaster used in cases of uncomplicated fractures was unimportant.

The immediate difficulty was to render the plaster sterile without destroying its other properties. Our initial procedure was to submit the plaster in its original unopened container to dry heat, utilizing the upper shelves of the gas oven and maintaining a temperature of 200° for 2 hours. However, the bandage base, in many instances, charred to a degree where tensile strength was completely lost, while the plaster assumed a lumpy friable nature and after application failed to set and dry within a reasonable period of time. However, by trial and error it was found that a usable product resulted when a temperature of 190° was maintained for one and a half hours. Plaster so treated has, to date, proved bacteriologically sterile. However, considerable variability in the quality of the plaster treated by this means has been noted and there has been some wastage as a result. The surgeons also complain that setting and drying are somewhat delayed. However, these inconveniences are over-balanced by the increased margin of safety obtained.

Results obtained by autoclaving the plaster have, from a practical point of view, been less satisfactory inasmuch as the quality of the end product is more variable, probably because of the difficulty in maintaining moisture-free con-

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ditions. For the time being this method of sterilization has been abandoned because of the high wastage of the plaster.

#### SUMMARY

The results of the bacteriological analysis of 194 plaster of Paris bandages have been presented. Most of these were found to contain potentially pathogenic anaerobic bacteria and these facts are presented to the medical profession for evaluation of their significance.

The practical difficulties associated with sterilization of plaster bandages are discussed.

### MIGRAINOUS DISORDERS OF THE SMOOTH MUSCLE SYSTEM\*

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**D**ISORDERED action of smooth muscle is responsible for many of the symptoms of chronic ill-health. It is responsible, most commonly, for many of the symptoms in an anxiety state. I am not dealing with those. Other disorders are those seen in essential hypertension and Raynaud's disease. I am not dealing with those. This discussion is concerned only with disorders of smooth muscle viewed as a system disorder exemplified in that ancestral family group disorder of the allergic and migrainous states. The following conditions are clinically associated in blood relationships, namely; eczema, asthma, hay fever, vasomotor rhinitis, cerebral migraine, some forms of adolescent dysmenorrhoea, intestinal (or abdominal) migraine (which includes cyclic vomiting of children and some adults) biliary dyskinesia, mucous "colitis", the allergies to heat, cold, light, inhalants, foods, and drugs, urticaria and angio-neurotic oedema. Psoriasis is distantly related to them.

The organism as a whole may be divided into two main layers of function. The *outer layer* of function, motor and sensory, has to do with relationships to the external environment. It has to do with consciousness and voluntary

action—outside information and action. All muscle used in this realm of movement is *striated* muscle.

The *inner* layer of function sub-serves that outer layer. It is deeper, more primitive phylogenetically, is automatic, non-conscious and non-volitional, and can be termed the nutritive layer. It has to do with inside function, information and action. Where muscle is used it is all *smooth* muscle. And the disorders of this smooth muscle system are part and parcel of the disorders of this whole layer. In a never-resting state of rhythmic flux, it has to do with the general business of maintenance and supply and the integration of the living cell commonwealth in order that the outer layer may achieve and create in its surroundings. This inner layer of function meshes intimately with the instincts and emotions. But I shall not deal with that. The inner layer has to do with; the regulation of temperature; the vascular reactions to posture, nutrition and metabolism generally. To it belong the endocrine hormones; all the stimuli of the autonomic nervous system: the enzymes including histamine, and other chemical substances; and the immunological mechanism that has to do with the inflammatory and allergic reactions.

Smooth muscle action is inherent in itself. Even when isolated it is capable of sustained contraction or tonus, to which rhythmical contraction may be superadded. It is also altered by the action of substances directly on its cells and in addition responds to stimuli from the autonomic nervous system. In different areas the action is reversed under the same influence, as for example with adrenalin in relaxing bronchial muscle and contracting arteriolar muscle. Similarly under the stimuli of the autonomic nervous system, in one area the parasympathetic is acceleratory while the sympathetic inhibits but in other areas the reverse is the case.

Smooth muscle is the chief reactor in what is called the allergic reaction and also in the migraine disorder. In the same individual or family group they are commonly interchangeable under certain conditions—mainly to do with the age. Sometimes they occur together. The abnormality is not the fact of reaction but the excessive degree of the reaction. We do not know the cause. It is a constitutional, architectural, inherited, peculiarity in a family

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group transmitted most often but not exclusively through the females. The reactions do not seem to be dependent on the presence of an abnormal substance nor a normal substance in excessive amounts or in insufficient quantity. To the human species most "allergens" are normal substances and are present in a normal amount. An allergen is often defined as a substance external and foreign to the organism. But is it not possible that it is not of necessity this, but may be internal and native to the organism? This may explain why the allergic person is also the migraine person. The proper designation is that of the allergic-migrainous person in the largest sense. You see them at one time of life and you could call them an allergic person but if you see them at a different age you would say they have migraine. One recognizes, often enough for it to be impressive, that there is a psychic personality and constitution to these people which is just as definite, as interesting and as difficult.

One might suggest therefore that on the migrainous side of the disorder, the allergen—so-called—may be a native and internal normal substance and the essence of the abnormality is the hyper-reaction or hypersensitivity of smooth muscle to it. Histamine is a favourite example. That may be the reason why the search for an allergen in migrainous reactions is almost entirely a barren field and, except for a few instances where it has real practical value, in allergic reactions also. The degree and the site of these reactions show marked alternations.

The system of smooth muscle is distributed in the blood vessels, including those of the skin and mucous membranes, in the intestinal tract from the lower half of the œsophagus to the anus, in the bronchi, in the urinary tract including the capsule and pelvis of the kidney, in the Fallopian tubes, the uterus and broad and round ligaments. It is also in the capsule and trabeculae of the spleen and sometimes in the trabeculae of the large lymph glands and in the sweat and some sebaceous glands as the minute erector muscles of the hair follicles. All these areas are possible sites for the disorder to be exhibited and careful analysis of minor and diffuse symptoms will reveal them in some cases.

Knowing that the smooth muscle system is so widely distributed and that it is part of that

inner group of tissues one can understand better why the site and kind of reaction might change about with the epochs of infancy, childhood, puberty, during adult life, (with the variation occurring during the menstrual cycle) in pregnancy and lactation, and at the climacteric and in senescence. The word migraine—meaning one-sided headache—is now misleading because the migraine reaction is just as frequent in other parts of the smooth muscle system as in the muscle of cerebral blood vessels. The characteristic of all is their periodicity or paroxysmal episodic tendency, their relative suddenness in onset, a refractory phase, and their real independence of psychogenic factors as a direct cause. In any particular individual the duration of the attack in any area is usually very constant. It may be 30 minutes, 1 hour, 2 hours, a day, two days or one week. The common sites for the migraine attack are:

*First.*—The cerebral site, called migraine headache, beginning with the aura of unusual well-being the day before and, in the actual attack, the scotomata and paræsthesias, and often ending with nausea and vomiting and accompanied by disturbances of equilibrium. These dysequilibrium attacks are not vertigo and may be independent of the headache. During or just after the attack polyuria may occur.

*Second.*—The intestinal tract: gastro-intestinal or abdominal migraine is separate from the headache variety from which the particular individual may never suffer. It has the migraine watermark, however, in having that periodic tendency; going through a set ritual and pattern lasting for a certain time and followed by complete freedom for an interval. In children gastro-intestinal migraine goes by the name cyclic vomiting. It usually passes off during puberty.

A boy now 18 has a history of attacks of vomiting since the age of 8 occurring once a year for two years, twice a year for the next seven years and every two months for the last year. Otherwise he is entirely well and is normal. Each attack is exactly similar. He has no warning. He goes to bed well. On waking he finds himself feeling nauseated, vomits a pint in which he recognizes food eaten 13 hours before. Then he vomits violently all day without pain or headache. He goes to sleep the next night and wakes well the next day. In the family group his mother had cerebral migraine for 15 years before the age of 44, when it stopped. Her mother had cerebral migraine too. A cousin on the mother's side has asthma. This boy's older sister began to have migraine headaches at seven and severe dysmenorrhœa from puberty. She is now married. She has had one pregnancy during which she had no headaches whatever. Her baby was born in June 1946.

Within three weeks of the termination of this pregnancy she had her first recurrence of headache. Since that time the headaches have become more frequent and more severe but this doubtless may have been due to the lowering of her reaction threshold by her getting worried and tired because her baby had eczema on its arms, legs and abdomen for the first five months only.

*Abdominal migraine* with pain from extreme spasm is seldom seen in children. In adults it is moderately common. A small proportion of the patients who are chronic abdominal complainers are sufferers from abdominal migraine and have become psychoneurotic in addition. With care in analyzing the symptoms one can distinguish those due to each—the psychoneurotic abnormality superimposed on a background of migraine. Spasm of smooth muscle in the intestinal tract may be in the upper tract; the small intestine, or the colon, and is important because abdominal pain, especially when so severe and obscure suggests structural disease that might appear to require surgical treatment. Laparotomies, cholecystectomies and appendectomies have often been done in these patients as in psychoneurotics. The attack begins with discomfort in some area of the abdomen, ranging from a full gassy sensation to steady (described by the patient as crampy) pain which increases in intensity and can be agonizing. Certain foods, especially raw vegetables or condiments, are frequently blamed, though in the refractory intervals they have not caused discomfort. These substances are often few, are quite definite and do not vary. They are frequently favourite articles in the patient's diet. This abdominal discomfort continues and is accompanied by constipation with narrow stools and some mucus, or diarrhoea and long strings of mucus which they may bring to show you, often thinking that they have passed a tape worm. This is true mucous "colitis". The patients showing the diarrhoea and the large amount of mucus may be those with the disturbance in the small intestine. The attack lasts a day or two or a week and then disappears entirely. As the years go on the attacks come closer together so that the time may come when there is continuous discomfort for months. They often describe their abdominal discomfort as a rolling, rumbling restless abdomen. When the main site is in the colon the attacks will be those of severe constipation.

Mrs S., a married woman of 48, about 12 years ago, at the age of 36, began to have an occasional pressing

pain in the upper abdomen lasting a few minutes only. It would happen once or twice every 2 to 3 months. During the next two years she would get bouts of sudden constipation and at these times she was liable to have this upper abdominal pain. Without warning, having been well, for an interval, her bowels fail to move as usual. Later in the day she has sudden pain in the left upper quadrant with a feeling of distension but never actual distension. This pain might spread to the epigastrium, last half an hour and go away slowly or get worse. Sometimes the pain will come on in the middle of the night waking her out of normal sleep and last for another 12 hours, going away completely for a while only to return. It may not be accompanied by nausea or vomiting. If her bowels do move the stools are narrow and tend to be long. The pain is not a colicky pain but a feeling of a pocket of gas under pressure in one area or an indrawing vacuum feeling. Some relief is obtained if pressure is applied over the place. The constipation with narrow stools containing a small amount of mucus without blood will continue for a week or ten days and then as suddenly disappear and be followed for two or three months by perfect bowel function with stools of normal diameter and freedom from any pain or gas.

Her attacks do not synchronize with any emotional disturbance, as when there was a strike on at the dairy which she owned, or when her eldest son, now 28, was having an especially bad time with his asthma (which he began having at the age of 12), nor when a year ago her husband died suddenly from coronary thrombosis, nor when her younger married sister now aged 39 would worry them all sick with one of her periodic obsessional states. This sister thought that she had cancer in her bowel because she was having another spell of that left abdominal pain ("of mine") with narrow stools covered with mucus—periodic attacks which she had had for 13 years following the birth of her son (who had eczema for the first three months but has had no ailment since). These anxieties, she says, would not bring on an attack but the pain came out of the blue when everything was going smoothly and even when she was holidaying in Florida six years ago. In this instance she had an attack beginning in the middle of the night and she was saved from a laparotomy for possible intestinal obstruction by it vanishing as quickly as it came. Her mother aged 74 who was with her at the time, then had a violent attack of urticaria for the first time in her life. This lasted six months and all the skin tests that they could be bothered to do were positive. The mother had had severe migraine headaches from 18 to 50 years of age but had had no manifestations of the same nature from 50 to 74.

In these cases, as in others, the only common finding from x-ray examinations, frequently repeated, and other tests carefully done, is that the gall bladder empties slowly and the colon instead of showing the usual haustral markings in an exaggerated fashion as you might see in a spastic colon, may show a tube-like effect, but not a very narrow tube. This is often reported to be an atonic colon. It is perhaps possible that this is evidence of an unusual type of increased tone in the longitudinal muscle, because these are the patients who have characteristically narrow stools. In the intervals between attacks the gall bladder will empty normally and the colon will appear ordinary. The x-ray picture therefore rather corresponds to the patient's description that

"everything slows up". The only drugs which seem to help these gastro-intestinal symptoms to some extent are phenobarbital in small doses and atropine given to the highest point of tolerance. It will be found that their tolerance is unexpectedly high. Nitroglycerine may be experimentally used.

Patients will often say that eating too much fat will start an attack. A very few cases may have a greatly decreased tolerance of fat and show a striking pyloric trigger effect. A truer explanation is that having been in refractory phase they have eaten everything because they felt better. If the refractory period is nearly at its end and they are about to have an attack the taking of a lot of fat at this juncture, the slow emptying of the stomach as a result, with increased action on the part of the pylorus may initiate an impending attack a little sooner.

Many cases of migraine have a definite relationship to the menstrual period and it is not so long since serious consideration has been given to hysterectomy especially if there is a fibroid present, in the hope that it might cure. Happily this tendency is becoming obsolete. It is in these cases that there is some reasonable basis for giving oestrogenic substances a trial. In abdominal migraine, as in psychoneurotics, the temptation to blame some structural defect which is really there, such as adhesions, a fibroid, a withered appendix, some gall stones, a cystic ovary, a prolapsed kidney or a possible ureteral stricture is naturally strong. If the smooth muscle of the bladder is involved in this disorder a cystoscopic examination will reveal no abnormality. Of course, there is nothing to prevent these patients having the ordinary structural diseases in all these organs which may be giving symptoms in addition. Therefore it can be seen that a very careful appraisal of all the symptoms can be a highly difficult problem. No alteration in the migrainous-allergic reaction must be expected or promised. There is one difficulty here: constitutional functional disorders of this inner layer of function which was mentioned at first are characteristically altered in a most subtle fashion by changes in environment. If any operative procedure is done on migrainous-allergic people (and the same is true of psychoneurotics) a complete change in their life during the period of hospitalization, the operation itself, the anaesthesia and the

convalescent period will in some way change the behaviour of this nutritive layer of the individual and they may be much improved for a varying time quite apart from the actual structural abnormality which has been removed. As in many forms of therapy illogical thinking is easier than discerning the truth. Asthmatics who have reached a crisis in their frequency and severity of asthma are improved by merely putting them in hospital. Some may say that this is a psychological effect and in part it may be but if so then a tonic psychological state must have a hormonal or a humoral bio-chemical effect on a much broader and deeper basis than what is usually called psychotherapy.

Another point of interest in the allergic-migrainous cycles is that any severe infection or other structural disease intervening, is very likely to bring about a refractory state in that reaction whether it is asthma, eczema or one of the other migraine equivalents.

The treatment of the migrainous-allergic individual requires experience. It consists of two parts: the treatment of the patient himself and the treatment of the disorder which he has inherited. The treatment of the patient is to explain the nature of the disorder in such a way that he can grasp the idea. Explanation, by removing the mystery and relieving him of the necessity of extensive investigation to find some involved, deep seated, and by implication, serious cause, takes a great burden off the patient's mind. It is important to stress the automatic nature of the cyclic attacks; that it cannot be cured but can be improved. Because we know that the inner layer of function in which the disorder is embedded subserves the outer layer and that it can be most powerfully influenced by it, therefore, a sensible constructive manner of living and thinking, consciously and intelligently directed is of more value than any drug and preparatory and basic to the use of any.

The treatment of the disorder itself consists in an ingenious use of all those drugs or substances which have an action on smooth muscle directly and those which have an action by way of the autonomic nervous system. These include ergotamine tartrate, prostigmine, histamine, nitroglycerine, adrenalin, ephedrine, atropine, benadryl, the oestrogens and testosterone and the various barbituric acid compounds. The most useful are the barbiturates,

ephedrine, adrenalin, ergotamine tartrate, nitroglycerine, atropine and benadryl. In cephalic migraine the barbiturates, ephedrine, and ergotamine tartrate are best. In abdominal migraine the barbiturates, atropine and nitroglycerine as drugs and a diet of low residue without condiments or highly tasting foods and in a few cases low in fat. If enemas are necessary at the outset normal saline should be used and never soapy water. In functional dysmenorrhœa of this group estrogenic substances may be used and in a few testosterone, carefully, in addition to trials with atropine and ergotamine. In the cephalic migraine which returns as a symptom of cerebral arteriosclerosis the barbiturates are usually sufficient, sometimes with ephedrine.

These disorders being chronic and recurrent, somewhat mysterious and the treatment often disappointing and advice bad, are frequently accompanied by, or are the cause of, a psychoneurotic anxiety state. A psychoneurotic state in itself produces disorders of smooth muscle, but not these disorders, and if that individual has already a smooth muscle system with an inherited disorder engraved on it one can understand the confused picture. Under these combined circumstances to treat this as a psychoneurosis only will be most disappointing, and to treat it as a migrainous-allergic disorder only, will also be unsatisfactory. One must take time to disentangle the symptoms, to understand each patient's individuality, to get all the family history, and to repeat the explanation at frequent intervals.

Medical Arts Building.

## RÉSUMÉ

Panorama du rôle de la musculature lisse dans les manifestations de la migraine. La crise hémicranienne est souvent suivie de manifestations abdominales (vomissements, sensation de ballonnement ou de crampes); mais celles-ci peuvent se produire isolément. Dans ces cas, leur nature migraineuse se manifeste par l'allure paroxystique et périodique, la soudaineté du début, la phase réfractaire. Les facteurs psychiques ne semblent pas déterminer la crise, bien qu'ils la compliquent. Par contre, les troubles digestifs paraissent être en rapport avec certains aliments, certaines allergies, ou la menstruation. La dysménorrhée elle-même, et certains désordres fonctionnels de la vessie, de la vésicule biliaire ou même des bronches (crise asthmatique) peuvent apparaître comme phénomènes migraineux. Au traitement pharmacologique (tartrate d'ergotamine, prostigmine, adrénaline, benadryl, substances estrogéniques, barbituriques), il importe d'adjoindre la psychothérapie. Celle-ci aura avantage à comporter l'explication faite au patient, et souvent répétée, de ses symptômes et de leur mécanisme.

PAUL DE BELLEFEUILLE

## DIAGNOSTIC BRONCHOSCOPY\*

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THE value of bronchoscopy as a therapeutic measure, particularly for removal of foreign bodies, is realized by everyone; however, its usefulness in the diagnostic field of pulmonary lesions is not so universally appreciated. The procedure frequently serves a dual purpose, that is, it may aid in the diagnosis and localization of a lesion and at the same time therapeutic measures such as aspiration, dilatation, cauterization, or instillation of chemotherapeutic agents may be performed. Some of the indications will be briefly mentioned and a few illustrative cases shown.

I prefer a combined local and pentothal-curare anæsthetic. Thanks to the co-operation and initiative of Dr. Claire Rumball at Deer Lodge Hospital a satisfactory technique was evolved in March, 1946. This was also approved and is being used by Dr. D. C. Aikenhead and his staff at the Winnipeg General Hospital. The pharynx and larynx are sprayed or painted with  $\frac{1}{2}$  or 2% pontocaine immediately before operation. Curare and pentothal are then given intravenously. The patient experiences no discomfort and will submit, if necessary, to repeated bronchoscopies, without undue apprehension. Over 600 cases have since been done by this method. Children are usually given an ether anæsthetic.

## INDICATIONS

*Atelectasis.*—This contributes more or less to the clinical picture in all acute and chronic pulmonary lesions. Any case with even a small amount of atelectasis should be considered for bronchoscopy. This need not be delayed if the lesion is chronic; if it be of recent origin or associated with an acute onset such measures as posture, chemotherapy, carbon dioxide, and breathing exercises may be tried. If there is no immediate response a bronchoscope should be passed. Occasionally the patient may show a clinical response to chemotherapy and one may be misled into thinking the lesion has cleared. A check plate must therefore be taken. Several such cases have shown a small.

\* Read at the Seventy-ninth Annual Meeting of the Canadian Medical Association, Section of Medicine, Toronto, June 25, 1948.

persistent atelectasis which proved to be due to an endobronchial tumour, although originally diagnosed as pneumonia. Lesions which may be found are: tumour, benign or malignant, foreign body, endobronchial tuberculosis causing obstruction, or cicatricial stenosis.

*Undiagnosed pulmonary infiltrations.*—Patients with these lesions should always be bronchoscoped. If no endobronchial lesion is seen, saline washings may be taken by irrigating the affected lobe or bronchus and these will occasionally prove the diagnosis to be due to tuberculosis, tumour, fungus, etc.

*Hæmoptysis.*—It goes without saying that any patient with definite hæmoptysis should be bronchoscoped: not only may the above conditions be found, but occasionally a simple ulceration of the bronchus will be encountered which can be cauterized. It may be necessary to scope a patient during massive hæmorrhage to prevent aspiration and drowning. A prominent Winnipeg physician was thus done while having a sudden severe hæmoptysis. A polypoid mass which was thought to be an adenoma was removed and accidentally lost down the suction drain, but the bleeding area from the base was packed with oxyeel, and bleeding controlled. There is no doubt that this procedure plus the transfusion of four bottles of blood was lifesaving.

*Chronic cough.*—Most often one finds no evidence of any lesion in the major bronchi and one wonders if such a condition as chronic bronchitis *per se* exists. About 200 of these cases have been investigated at Deer Lodge Hospital and will be more fully reported at a later date. Occasionally, especially in children, a non-opaque foreign body may be found which is only partially obstructing a bronchus. In others a small pedunculated endobronchial tumour may be found.

*Wheezing.*—A chronic complaint of "wheezing" or the discovery of persistent wheeze on examination suggests partial occlusion, and may in itself justify bronchoscopy. Generalized edema and bronchospasm as observed endoscopically will corroborate a clinical diagnosis of allergy. Cases with unilateral wheeze have been found to have tumour, one a bronchial stricture, another an endotracheal fibrous band following an old G.S.W. to the neck. His x-ray and examination had been negative. Still another patient had polypoid granulations in

the stump of the left lower lobe bronchus following a lobectomy. These were periodically partially blocking the upper lobe bronchial orifice, producing the symptoms and signs, and were successfully removed.

Recently two small children were brought in by their parents because the mother in each case had noted the child wheezing; in one case for six weeks, and in the other, three weeks. Obstructive emphysema was suggested by x-ray. A peanut was the cause in one, and a piece of walnut in the other.

*Localization.*—This is very important if surgery is contemplated, as the site and extent of an endobronchial tumour will determine operability. Frequently widening of the carina will indicate mediastinal lymph node involvement. Bronchiectasis may be thought to be localized to one lobe by the appearance of a bronchogram, but bronchoscopy may reveal pus coming from other lobes as well, and these cases frequently do not stand operation well, or do poorly postoperatively.

The following cases illustrate the part played by bronchoscopy in their diagnosis.

#### CASE 1

Mrs. L.K., aged 64 years. First seen October 6, 1947.

*History.*—In 1935 she visited a clinic in U.S.A. because of cough for one year. Small amount of green sputum, frequent "rattles" in throat. Sputum negative for tuberculosis. X-ray showed some infiltration at right base. No bronchogram. Diagnosis, likely bronchiectasis. Frequent winter chest colds for the next 12 years.

September 16, 1947.—Intravenous pyelogram because of frequency and "bladder irritation". That evening "rigor" followed by cough with green sputum. Treated at home with oral penicillin. September 29.—X-ray showed atelectasis right middle lobe. No sputum. October 7.—Bronchoscoped. Right middle lobe bronchus completely occluded by granular edematous mucosa, adjacent mucosa of right lower lobe bronchus involved but not occluded. Two biopsies taken; bronchus dilated and aspirated and secretions examined. The biopsy showed chronic granulomatous inflammation, probably tuberculosis. Culture B pyocyaneus, diphtheroids. A small amount of sputum obtained later was positive for tuberculosis, and a repeat biopsy showed tuberculosis.

Thus the biopsy obtained at bronchoscopy first suggested the diagnosis of endobronchial tuberculosis.

#### CASE 2

Mr. H.Z., aged 37, blacksmith. Admitted to hospital December 16, 1947.

In May 1941 he enlisted. X-ray chest negative. On active service in Europe 1941-46. In 1943, acute respiratory infection in Italy. Cough, expectoration, fever. Treated with sulfa drugs. Slight cough and green sputum persisted. Discharge x-ray negative in 1946. In April 1947, exacerbation of symptoms, plus pain right chest. Given sulfa drugs with improvement. X-ray showed a fairly dense shadow extending out from the right hilum into the apical zone. In July, x-ray (Fig. 1) showed clearing of above opaque shadow but now there were fibrous strands extending out from hilum with pulling over of heart and mediastinum. Sedimenta-



tion rate normal. September.—Symptoms more severe again and began to lose weight. December 6, hæmoptysis, fairly gross, 24 hours.

On admission to hospital, temperature 101°; white blood cells 14,000; polymorphonuclears 86%; lymphocytes 12%; monocytes 2%; sedimentation rate 104 mm. in 1 hr. X-ray (Fig. 2) showed semi-opaque shadow involving most of the right apical zone, with some displacement to right, and tenting of medial portion of diaphragm. Repeat white blood cell, 20,600. Sputum negative for tuberculosis and tumour cells, culture *Dip. pneumoniae*. Guinea pig inoculation negative. Tuberculin positive 1:10,000.

Bronchoscopy on December 23, showed slight narrowing of the right upper lobe bronchial orifice. The upper lobe was irrigated with saline, and the collected specimen centrifuged; direct smear revealed *Actinomyces bovis* (Fig. 5).

A diagnosis of pulmonary actinomycosis was thus established by microscopic examination of bronchial washings. I thank Dr. J. L. Downey, Deer Lodge Hospital, for permission to publish this case report.

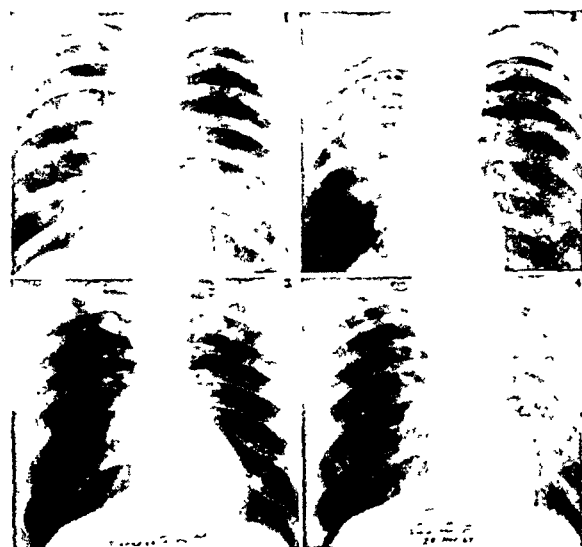


Fig. 1. (Case 2).—July, 1947, fibrous strands extending out from right hilum with shifting of mediastinum. Fig. 2. (Case 2).—December, 1947, semi-opaque shadow right, further shift, tenting diaphragm. Fig. 3. (Case 3).—July, 1947, infiltration left apex. Clinical diagnosis tuberculosis. Fig. 4. (Case 3).—November, 1947, increase in infiltration, beginning shift, suggesting atelectasis.

#### CASE 3

Mr. A.M.Y., aged 42 years, school teacher. First seen November 25, 1947.

In February 1942, he had non-productive cough. May 1946, demobilized. Some mucoid sputum. X-ray negative. Pensioned 20% for "bronchitis".

September 1946, recheck X-ray negative. July 10, 1947, X-ray (Fig. 3), infiltration left apex. Diagnosis, pulmonary tuberculosis. Sputum negative for tuberculosis.

July 24, transferred to Central Tuberculosis Clinic. Sputum and gastric washings negative for tuberculosis on smear, culture and guinea pig inoculation.

October, low grade fever and increase in sedimentation rate. Recheck negative for tuberculosis.

November 20, X ray, (Fig. 4) increase in infiltration, left upper lobe. Some shifting of mediastinum suggesting atelectasis.

November 25, bronchoscopy. Some thickening of septum between left upper and lower lobe bronchi, overlying mucosa granular, bled easily, could be inflammatory or malignant. Biopsy from septum—no evidence

of tumour. Saline washings from lower upper lobe, squamous cell type bronchogenic carcinoma (Fig. 6).

On the strength of this later report a left pneumonectomy was done in December. The pathological report showed squamous cell carcinoma, Grade II.

This case illustrates how bronchogenic carcinoma may simulate tuberculosis and demonstrates again the value of bronchoscopic collection of saline washings in establishing a diagnosis of pulmonary infiltration.

#### CASE 4

Mrs. I.C., aged 27 years. First seen, and admitted to hospital, March 10, 1948.

May 1947, slight pain right chest. Said to have dry pleurisy. Kept in bed at home one month because of family history of tuberculosis. Good recovery. November, febrile illness, with recovery. X-ray report, linear markings right base medially, possibly pneumonia.

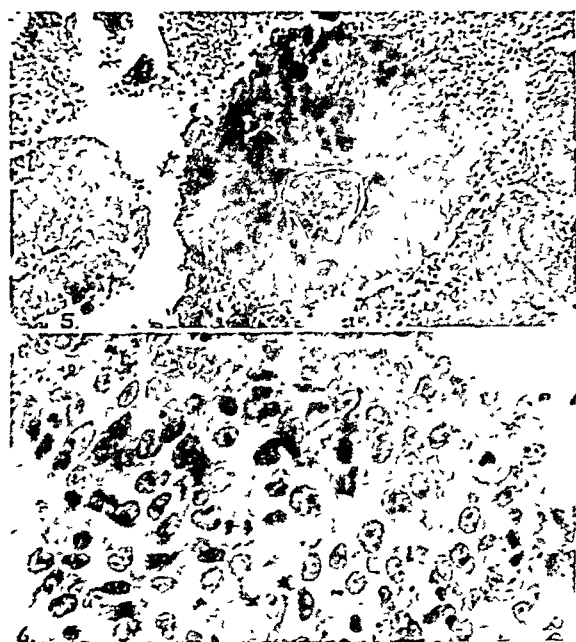


Fig. 5. (Case 2).—December, 1947, direct smear of bronchial washings demonstrating *Actinomyces bovis* (x100). Fig. 6. (Case 3).—Bronchial washings (x500) demonstrating carcinoma cells with mitotic figures.

March 1, 1948. Spat up one drachm fresh blood. No other symptoms. No further hæmoptysis. Abrupt onset of non productive cough, fever, pain right chest, and general malaise one week later.

On admission x-ray showed atelectasis right lower lobe. Bronchoscopy showed sessile tumour with firm base, fixed to the wall and occluding the right lower lobe bronchus. Biopsy showed bronchial adenoma.

Lobectomy of right middle and lower lobes was performed on March 30, and diagnosis confirmed.

Here the diagnosis of adenoma was established in a young lady living in a tuberculous environment.

#### CASE 5

Mr. P.S., aged 62 years. First seen and admitted to hospital April 23, 1948.

Insidious onset of cough, expectoration, dyspnoea on exertion, pain in left chest and slight loss of weight in



October 1947. X ray later (Fig. 7) showed marked emphysema with infiltration of both bases, especially the left. Sedimentation rate 45 mm. in 1 hr. Diagnosis, emphysema with basal sepsis.

Another x ray in April, 1948: left lower lobe denser, tissue to vessel suggesting collapse. Bronchogenic carcinoma considered.

On admission to hospital, x ray showed no change at April 25, 7, 8, 9, and 10). Sedimentation rate 99 mm. in 1 hr.

April 28 severe pain left chest, dyspnea, fever. X ray (Fig. 10), now shows left pleural effusion. Clinical diagnosis of bronchogenic carcinoma with effusion made with confidence, although no tumour cells were found in the sputum.

May 1, bronchoscopy. A large piece of charcoal 1 cm. square and 2 cm. thick was found and removed from the left main bronchus at the junction of upper and lower lobes. Surrounding granulations completely occluded the lower lobe bronchus but only partially obstructing the lumen of the upper lobe.

Postoperatively the patient admitted eating charcoal for years, "for my stomach". He said he had frequently "choked" while eating it, but had always managed to cough these pieces up, and denied any relationship to the insidious onset in October, 1947.

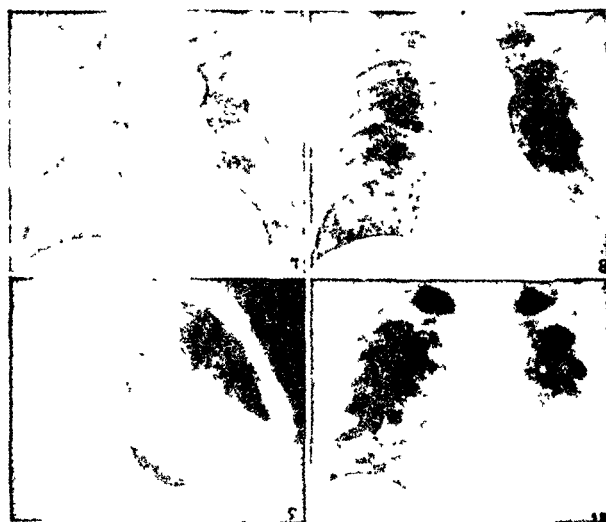


Fig. 7. (Case 5).—February 19, 1948, marked emphysema and infiltration both bases. Figs. 8 and 9. (Case 5).—April 24, increased density and atelectasis left lower lobe. Bronchogenic carcinoma considered. Fig. 10. April 28, pleural effusion left.

The clinical history and findings in a man of this age most certainly suggested a diagnosis of bronchogenic carcinoma. Again the bronchoscope was invaluable.

#### CONCLUSION

If bronchoscopy is used in conjunction with other present day diagnostic procedures a closer approach will be made to the physician's dream of 100% accuracy in diagnosis and localization of pulmonary lesions.

The collection of bronchial secretions and specimens by endobronchial irrigation with saline is highly recommended.

The bronchoscope will prove as useful to the chest physician as the cystoscope to the urologist.

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#### RÉSUMÉ

La bronchoscopie, dont le rôle thérapeutique est d'ores et déjà bien établi, gagnerait à être mieux connue dans ses applications diagnostiques. L'auteur cite plusieurs de ses indications, et son utilité dans chaque cas. Atelectasie: on trouvera un bouchon muqueux retardant la résolution d'une pneumonie, ou bien une tumeur endobronchique, un corps étranger, une ulcération tuberculeuse, etc. Infiltrations pulmonaires d'étiologie obscure: le lavage bronchoscopique au moyen d'un soluté salé permet de ramener de quoi poser un diagnostic cytologique. Hémoptysie: en plus de sauver des malades en imminente inondation pulmonaire, la scopie permet souvent de localiser le point qui saigne et de le cautériser. Toux chroniques: beaucoup de "bronchites chroniques" se révèlent être en réalité dilatation des bronches, corps étrangers non visibles à la radiographie, polypes, etc. On peut en dire autant de certains pseudo-asthmes. Outre l'étiologie, le bronchoscope sait aussi indiquer la localisation des lésions, et souvent déterminer ainsi l'opérabilité d'une broncheectasie, d'un cancer pulmonaire. Il décèle aussi les hypertrophies ganglionnaires faisant pression sur les bronches. L'auteur rapporte trois observations illustrant le rôle diagnostique du bronchoscopiste.

PAUL DE BELLEFEUILLE

## THE TREATMENT OF CHRONIC SINUSITIS IN CHILDREN

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THE diagnosis and effective treatment of chronic sinusitis, at whatever age, are of paramount importance to the welfare and future well being of the individual concerned. I have felt the urgent need for some method or combination of methods for the effectual relief of sufferers from sinusitis. It is in the young children that one's ingenuity is taxed to the limit, and it is for these especially that I am most concerned.

During the past three decades a great deal of knowledge has been gained about the physiology of the nose, but much has been left to conjecture regarding the physiology of the accessory sinuses. It is due to this knowledge and to the many failures of surgical interference that the modern trend of treatment leans away from the more radical methods of treatment in vogue some twenty-five years ago.

It has been established that the mucous membrane of the accessory sinuses is continuous with that of the nose. Histologically this mucous membrane is composed of the pseudo-columnar ciliated variety of epithelium, the surface cells of which lie on a basement membrane, a thin, undifferentiated band of tissue which limits the epithelial cells from the underlying tissue. The exact origin of this membrane is still in doubt, but it is thought to be derived from connective tissue. Through the canaliculi which it contains wandering cells escape to the surface. Beneath the basement membrane is the

tunica propria, a fibro elastic connective tissue network, which, at the superficial portion is loosely interwoven, but at the deeper portion is dense and compact. Where the mucous membrane overlies bone, the deep, condensed and compact layer of the stroma constitutes periosteum; whereas, where it overlies cartilage, it is called perichondrium. This tunica propria is the supporting structure, giving support to the mucous glands, nerves, blood vessels and lymphatics. Within the stroma are tissue cells, polymorphonuclear leucocytes, histiocytes, endothelial cells, fibroblasts, connective tissue cells and small round lymphoid cells.

The normal mucous membrane is covered with a thin sheet of mucus, and the movements of the cilia are always towards the ostia. This columnar ciliated epithelium is present throughout in the embryo and infant, but in the adult is absent from the anterior end of the middle turbinate, the anterior end of the inferior turbinate and in the olfactory cleft. These areas are known as the silent areas of the nose. Sinus infection is practically always secondary to an acute rhinitis. The normal histology of the mucous membrane is disturbed during an attack of acute rhinitis. In the early stage there is a vasoconstriction of the vessels soon followed by a vasodilatation, with at first, a lagging behind of the polymorphonuclear leucocytes along the vessel wall, then, by diapedesis, they pass through the wall and appear in the tissue spaces. The defence mechanism of the tissue is aroused and becomes active, as is evidenced by a migration of the wandering tissue cells to the site of the irritation, and consequent increase of the wandering cells in the mucosa. The blood stream is slowed, there is transudation of plasma into the tissue spaces. The cavernous spaces which occupy the inferior and middle turbinates are dilated and lose their power to contract. There is an excessive blood supply to the glands, producing excessive stimulation and consequent excessive secretion. In a few days, due to the deposit of leucocytes, fibrin and plasma cells, the discharge becomes thicker, and the colour and consistency of the discharge will depend largely upon the type of bacterial invader. Since the mucous membrane of the sinuses is continuous with that of the nose, it is all too clear that these sinuses become involved in the infection, so that every head cold is potentially an acute sinusitis.

This is but a brief review of the histology and histo-pathological changes in the mucous membrane of the nose and its accessory sinuses. The causative factors which are responsible for the latter may be grouped under the following headings: (1) Environment, diet, clothing. (2) Allergens—food, house dust, pollens, physical ("intrinsic"), clothing, etc. (3) Infection. (4) Infection superimposed upon an allergic diathesis. (5) Some anatomic deformity.

Environment plays a very important part as a causative factor in infections of the sinuses, and under this may be included, diets too low in vitamins A and D and C; too scanty or too much clothing; poorly ventilated, over- or under-heated houses; overcrowding in the home or in conveyances; improper rest; neglected personal hygiene, and other environmental conditions too numerous to mention, all of which have their place in the cause and complications of an acute rhinitis.

*Allergens.*—Every rhinologist is becoming more aware of this factor in his daily examination of patients suffering from sinusitis. House dust, certain foods, certain kinds of clothing, physical or "intrinsic" allergic reactions, and a "carry-over" from hayfever of the summer months with a bogging of the mucosa. It is not my intention to discuss the many and varied types of allergy responsible for an acute hypertrophic rhinitis.

Infection alone or infection superimposed upon an allergic manifestation, require a very careful estimation of the history and clinical findings.

*Anatomic deformity.*—Under this heading may be grouped such conditions as a high deviation of the nasal septum, impinging upon the middle turbinate and flattening this bone against the lateral nasal wall, thereby preventing proper drainage from the ostia situated beneath the middle turbinate; a thickened septum, a deviation of the nasal septum, with or without the high arched palate (an anatomical hazard with which to contend when he reaches the age when this can be corrected); polypi in the middle meatus obstructing the outlets from the ostia concerned; large bulla cells. Associated with these nasal conditions may be hypertrophied adenoids and infected tonsils. The hypertrophied adenoids will act as a barrier to the passage of air through the posterior choanæ and may, at the same time, dam back the secretions from the nose, themselves becoming laden with infection and acting as an added source of infection to the adjacent sinuses. Hypertrophied turbinates cannot be classed as a causative factor, but are the effects produced by infection and allergy. However, they are an added impediment to proper drainage.

*Symptoms.*—The rhinologist is often confronted with a child whose nostrils are constantly filled with a mucoid or muco-purulent discharge, constant "sniffing", general malaise and an indifferent appetite; who has been taken to the family doctor and for whom drops have been prescribed; until the parents have arrived at the conclusion that doctors in general and "drops" in particular, are of no use. They conclude that their child is one of those unfortunates who is always "catching colds", in spite of the "warm way in which I dress him", and in spite of "all the vitamins I give him". If he is of school

age he misses any number of school days, is usually none too bright in his class, and looks unhappy. He loses weight, is restless at night due to cough and nasal obstruction, and succeeds in keeping his parents awake. He feels generally miserable.

Headache is not a frequent symptom, except in older children, and even in these there is no definite localization of pain. The cause of the pain may be due to inflammation of the mucosa and blocking of the ostia, toxic irritation or actual inflammation of the branches of the fifth nerve as they pass just beneath the mucosa adjacent to the ethmoid sinuses, pressure on the ethmoidal nerves from oedema of the turbinate and the septum, a spheno-palatine ganglion neuritis due to irritation or inflammation of the Vidian nerve. There is usually a rise in temperature, of one degree or more. Headache, fever, nausea and vomiting are symptoms that are associated with the acute and sometimes the so-called subacute infections. They are never to be found in the chronic types of sinusitis.

*Diagnosis.*—The diagnosis of chronic sinusitis is made from a careful evaluation of the history and symptoms, both subjective and objective, with a confirmation of the objective findings by x-rays. It has not been my experience to find x-rays failing to confirm my diagnosis;<sup>1</sup> rather the contrary, x-rays have demonstrated such infection after there had been some doubt in my mind of the existence of such an infection. Further,<sup>2</sup> contrary to some observers, I have found that the ethmoid sinuses are the most common of all the sinuses to become infected, and that the maxillary antra become secondarily infected from these cells, probably due to their dependent position; 67% of all the cases diagnosed showed infection of the ethmoid cells, 20% showed the antra to be involved in an infection with the ethmoid cells, 10% showed maxillary antral involvement of the fronto-ethmoid cell, or of a frontal sinus if one existed as a separate sinus. A few cases only suffered a pansinusitis, and are not included in this percentage estimate. The incidence of sinusitis was found to be greater in boys than in girls.

*Treatment.*—The importance of a thorough and painstaking history of the case, and a careful evaluation of the clinical findings cannot be too strongly emphasized. Bearing in

mind that allergic manifestations are often associated with an infected sinus, every effort should be made, whenever possible, to eliminate the cause of such allergy. It so often happens that no definite reactions are obtained from the recognized tests, that one may be inclined to the belief that allergy does not exist in this particular case, but there remains the "intrinsic" form, and the parent should be instructed to avoid all emotional sources of irritation.

The methods which I have found most satisfactory in the elimination of sinus infections are twofold: (1) x-radiation; (2) Proetz displacement with penicillin 1:200 in physiological saline. In addition, the instillation of a vasoconstrictor in an aqueous physiological solution, and instilled by the Parkinson's method.

Very close co-operation must exist between the radiologist and the rhinologist during the course of treatment. The radiologist at our hospital has developed a technique and dosage which he and I have found to be the most effective. A series of 350 cases have been treated during the past four years; 75 other cases have been used as controls, where no x-radiation had been applied.

The eyes are first covered with a lead disc to prevent a mild conjunctivitis and to protect the eye lashes and eye brows. The machine used is a 200 K.V. and 15 ma. The filter is  $\frac{1}{2}$  mm. copper and 3 mm. aluminum. There is a daily dose of 70r in any one port (two minutes' duration), for four consecutive days. Three ports are used covering all the sinuses. On the first day of treatment the port is directed to the antero-posterior position, on the second day to the right lateral, on the third day to the left lateral, and on the fourth day back to the antero-posterior again. A rest period of ten days is allowed before the second course of irradiation is resumed, but only three doses of 70r are given, the last antero-posterior port is omitted. It is during this ten-day rest period that Proetz displacement with penicillin and the instillation of a vasoconstrictor are instituted. The parent is carefully instructed in the Parkinson method of instilling the drops.

The theory of this principle is that a mild inflammatory dose of x-radiation is given of such strength tending to produce two results: (1) In children to reduce the lymphoid tissue which proliferates and tends to impede drainage. (2) In children and adults to promote resolution of the existing inflammatory process. The effects, as noted by the patient, are of a slight but decided increase of the nasal discharge after the first treatment. This is followed by a change in the colour and consist-

ency of the discharge. The nasal obstruction is much improved and sometimes completely relieved, the headaches, if present, disappear. On completion of the second course of x-radiation, the vasoconstrictor drops are continued for approximately one week, the clinical findings are much improved and recovery from the infection is generally complete by the end of the week. One month after the completion of treatment x-rays are taken to confirm the absence of objective findings in the sinuses.

#### CONCLUSIONS

It has not been necessary to resort to operative procedures in any of the 350 cases treated by these methods. Freedom from the concomitant symptoms was early and sustained, with complete resolution in a shorter time than that obtained in the 75 "control" cases. No harmful results to the mucous membrane of the nose have been noted from the x-radiation.

Recurrences have been infrequent, although a few have occurred, but in these symptoms have been less severe than at the initial infection.

Some of the smaller children objected to the displacement, but this was modified to suit the individual, and after two or three treatments complete confidence was restored. In the cases of infection complicated by allergic manifestations removal or avoidance of the allergen(s) showed the same response as those with an infection only.

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TESTOSTERONE IN THE TREATMENT OF ADVANCED BREAST CANCER: A PRELIMINARY REPORT. Jones, H. W. Jr., *South. M. J.*, 41: 4, 1948.

Fifteen advanced cases of carcinoma of the breast have been treated with injections of testosterone propionate, 300 mgm. per week in divided doses. Three of five cases with metastases to the bone had clinical and roentgenographic evidence of healing; another case had pain relief but steady progression of the lesion, one case was a complete failure. Two of ten cases of extra skeletal metastases showed startling improvement while the remainder were failures. The variability of response noted in this and other series of breast carcinoma treated with testosterone is not at all understood and warrants further study.

## MYASTHENIA GRAVIS: BRIEF NOTES REGARDING DIAGNOSIS AND TREATMENT\*

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THE symptomatology of myasthenia gravis is generally well known. It conforms to a sufficiently constant pattern that the diagnosis is usually made readily by clinicians who have observed only a few cases. However, in some instances the diagnosis is difficult, and in such cases special tests are required to establish it.

In the treatment of myasthenia gravis neostigmine is being used extensively and there is fairly general agreement regarding methods of administration and dosages. This also applies to the use of adjuvant substances such as ephedrine, potassium and guanidine. Thymectomy has been effective in some cases during recent years but the indications for such operative therapy are unclear. The pathogenesis of the disease remains mysterious, although it has been amply proved that a precipitating factor which continues throughout the active stage is failure of the acetylcholine mechanism in the affected muscles.

In 1943 all cases seen in the Johns Hopkins Hospital, after neostigmine was available, were described with particular reference to the ocular signs. This, and the considerations stated above, has influenced the choice of material in this paper. Part I concerns diagnosis and is based on observation of 125 cases. Various headings are used to present information which may serve to amplify many excellent descriptions of the disease which are readily available in the literature. Occasional case reports are included in summary form where they may have particular interest. Part II concerns treatment, only as regards its ineffectiveness in "ocular" myasthenia, and the present status of thymectomy.

#### PART I: DIAGNOSIS

There are few diseases in which an accurate history is of more importance. Myasthenia gravis is characterized by remissions which may be complete or incomplete, short-lived or

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From the Wilmer Institute of the Johns Hopkins Hospital.

lasting for years. A definite history of remission and recurrence eliminates those diseases affecting muscles which may reasonably be confused with myasthenia gravis: muscular dystrophy; progressive bulbar palsy; progressive external ophthalmoplegia.

#### INCIDENCE

In our series (125 cases) 57% occurred in females, 43% in males; 18% were in Negroes. The youngest patient was 3 years and the oldest 75. In the first decade there were 7 cases, in the second, 10, in the third, 39, and in the fourth, 25, in the fifth, 15, in the sixth, 10, in the seventh, 5, and in the eighth, 1. Among females 87% of cases commenced before the age of 40, and no female developed the disease after 53. In males, 56 had the onset before 40, and 44% commenced after this age, as contrasted with 13% of the female cases. Among Negroes the disease never had its onset after the age of 34.

*In children.*—We have observed myasthenia gravis in 7 children before the age of 10. Six of these were Negro girls, and one was a white boy aged 5 years. In all these children ophthalmoplegia was a prominent symptom. Two of these patients were of particular interest, and a summary of their case-histories is given below. Particular mention may be made concerning case 2. It exemplifies an acute onset of myasthenia gravis with rapid and apparently complete remission. During the stage of respiratory difficulty the bulbar form of anterior poliomyelitis might have been reasonably suspected.

#### CASE 1

Negro girl, 3 years of age, suspected of having brain stem involvement following an acute upper respiratory infection.

E.E.P., (A 10823), had recently suffered from a severe cold. The parents had noticed that for several days the upper lids drooped and the child could not move her eyes, also that she had stopped talking. Examination revealed bilateral ptosis and almost complete external ophthalmoplegia. The pupils were of normal size and reacted promptly to light. She could not or would not talk. All other examinations were negative. These included examination of the spinal fluid. We were not aware of myasthenia gravis occurring at this age and suspected some form of brain stem involvement.

A week after the first examination the child was seen again. She fell asleep in the waiting room and on being awakened opened the eyes widely once. The true diagnosis was suspected and was confirmed by the injection of 1 mgm. of prostigmine. This greatly improved the levator action, but failed to increase the range of ocular movements to more than a few degrees in any direction. The child became anxious to talk and did so actively. Efforts directed toward treatment were generally unsuccessful in so far as the ophthalmoplegia was concerned.

After several weeks the dysarthria (there was no dysphagia) disappeared. The child was sent home without treatment. Except for the ophthalmoplegia (ptosis and practically complete immobility of the eyes) she seemed normal. During several years the ocular status remained unchanged.

#### CASE 2

Laryngeal crisis(?) marked the onset of myasthenia gravis in a boy of five years. Brain stem lesion suspected when he entered hospital because of ophthalmoplegia. Acute onset remarkable, also the rapid recovery. Only white child younger than 10 years in series.

J.T.W., (A 25735) a white boy, 5, had been playing outdoors and asked for a drink of water which he swallowed without difficulty. He was then given a piece of chicken and could not swallow it. His eyes rotated upward and his mother thought he was dying. He grew drowsy, was unable to answer questions intelligibly and his voice became thick. He complained of pains in the eyes. He passed several normal stools.

On the following morning he was admitted to hospital. Examination revealed bilateral ptosis, apparent paralysis of the left externus, absence of gag reflex, and difficulty in swallowing. Later in the day he exhibited almost total external ophthalmoplegia. During the night he suddenly commenced having difficulty in breathing and became extremely cyanotic. A tracheotomy set was ordered. At this time a house officer gave him an injection of prostigmine, (0.5 mgm.). Within five minutes breathing became natural, he swallowed readily and the ptosis had almost completely disappeared. For two days this amount of prostigmine was injected each three hours. Omission of an injection resulted in recurrence of all the symptoms. On the third day he was given prostigmine by mouth (22.5 mgm. q. 3 h.; atropine, 0.2 mgm. injected q. 4 h.). The range of movement of the eyeballs gradually returned to normal, and all other symptoms gradually subsided. Within ten weeks after admission he required no medication.

The boy has not been seen recently but during several years' observation he remained symptom-free.

#### THE PHARMACODYNAMICS OF MYASTHENIA GRAVIS

It has been established that the extraocular muscles and in lesser degree the facial muscles are more sensitive than other striated muscles to substances belonging to the curare and choline groups. Curare, also quinine, produces a block at the myoneural junction. Eserine, choline, acetylcholine and nicotine stimulate muscle contraction through inactivating cholinesterase at the myoneural junction. As a result of the remarkable sensitivity of the extraocular muscles to curare, the earliest evidences of curare poisoning are precisely those of a vast majority of cases of myasthenia gravis, namely, ptosis and diplopia. It would be anticipated that individuals suffering from myasthenia gravis would experience an increase of symptoms as a result of the administration of quinine, and such is the case.

Neostigmine (prostigmine) is a parasympathetic stimulant. It is used as the sheet anchor in the treatment of myasthenia. Also it is useful in treating gastrointestinal atony. It might

be anticipated that diagnostic injections of this substance might produce intestinal cramps, diarrhoea, and shock from its influence on the heart. These side-reactions do occur. In order to minimize them atropine is given routinely when neostigmine is given for diagnostic purposes. We have observed, however, that with test doses (1.5 mgm. neostigmine hydrobromide and 0.6 atropine sulphate, both by injection) individuals who suffer from myasthenia gravis rarely exhibit side-reactions and are quick to remark they feel stronger. Conversely, individuals who do not have the disease often develop abdominal cramps, diarrhoea, pallor, and sweating, usually in that order if the reaction is severe. Often they exhibit muscular fibrillations. The systemic responses to prostigmine in myasthenics as contrasted with those obtained in normal individuals suggests that myasthenia gravis is a widespread disorder.

The pharmacology of the extraocular muscles has been ably and briefly summarized by Cogan whose book contains important references to original work. He defined myasthenia gravis as "a disease characterized by deficient transmission of the nerve impulse to the muscle fibre . . . (It), . . . may be considered as an insufficiency of the acetylcholine mechanism". Trethewie and Wright found that serum from myasthenics interferes with the production of acetylcholine.

#### INCIDENCE OF SYMPTOMS AND SIGNS

In a majority of cases myasthenia gravis is a widespread and disabling disease with, however, certain muscle groups exhibiting pronounced weaknesses. In all series which have been described external ophthalmoplegia and weakness of the facial muscles is the most frequent and the earliest evidence of the disease. In our series we do not have statistics concerning the other symptoms but the approximate order of frequency is: weakness of the jaw muscles, dysphagia, dysarthria, weakness of limbs, and of the muscles of respiration.

*Ophthalmoplegia.*—It is reasonable to include mention of almost all the ocular signs here because there are no changes in visual acuity, in the visual fields, or in the optic fundi. Since our cases already have been studied from this standpoint it is expedient to enumerate the important ocular findings as has recently been done by Harvey.

1. Usually ptosis is the first sign. Diplopia is the commonest and earliest symptom in most cases. Ocular signs frequently remain predominant, and usually are fluctuant.

2. Purely ocular myasthenia gravis occurs. We have observed it in several cases. In some instances there was a spread of the weakness after months or years.

3. In very few cases the ocular signs appeared late in the course of the disease.

4. The ocular signs may completely disappear during a remission.

5. Edema of the eyelids rarely is a prodromal sign of myasthenia gravis. No explanation for this is available.

6. Retraction of the eyelids is seen infrequently and usually occurs when there previously has been ptosis. We have observed it in several cases. In an elderly gentleman ptosis was an early complaint. Before his death as a result of respiratory involvement, the eyelids were widely separated and could not be approximated so that exposure of the cornea necessitated the use of oily drops.

7. Ptosis may be present in association with opposite-sided lid retraction.

8. Weakness of the orbicularis oculi is always present when ptosis exists. This observation, which is easily determined by asking the patient to close the eyes while the upper lid is held up with the finger, differentiates myasthenic from neurogenic ptosis. Weakness in closure of the eyelids is overlooked more often than any other common ocular sign.

9. The similarity of abnormal associated movements of the eyelids in myasthenia gravis and those resulting from misdirection of regenerated fibres in the third nerve has been observed.

10. Limitation of ocular movements occurs either unilaterally or bilaterally and in all combinations. We have observed a strictly unilateral ocular involvement in a single case. In many instances the ocular signs are misinterpreted. Some of the erroneous diagnoses with which we have had experience are: hyperthyroidism; postencephalitis; tumour of the brain stem; disseminated sclerosis. Nystagmoid movements occasionally are due to myasthenia gravis affecting the ocular muscles.

11. Changes in accommodation were noted only in one case, but slight changes might have been overlooked.

12. In our cases the pupillary responses to light were invariably normal. This observation has suggested a useful rule in diagnosis. If the pupillary responses to light are normal and the origin of a ptosis or other extraocular paresis is not crystal clear, myasthenia gravis should be suspected.

*Dysphagia and dysarthria.*—According to Viets dysphagia occurs more frequently in myasthenia gravis than dysarthria. He stated that approximately 20% of his series of cases suffered from dysphagia. Dysphagia and dysarthria are commonly associated symptoms and with them regurgitation of fluid through the nose is likely to occur. Viets makes the interesting point that in no other disease is a defective capacity to swallow improved as a result of the administration of neostigmine.

*Weakness of muscles of the extremities.*—Weakness of muscles of the legs and arms occasionally ushers in the disease. Women are often first unable to comb their hair. Occasionally the involvement of muscles is peculiarly bilaterally selective.

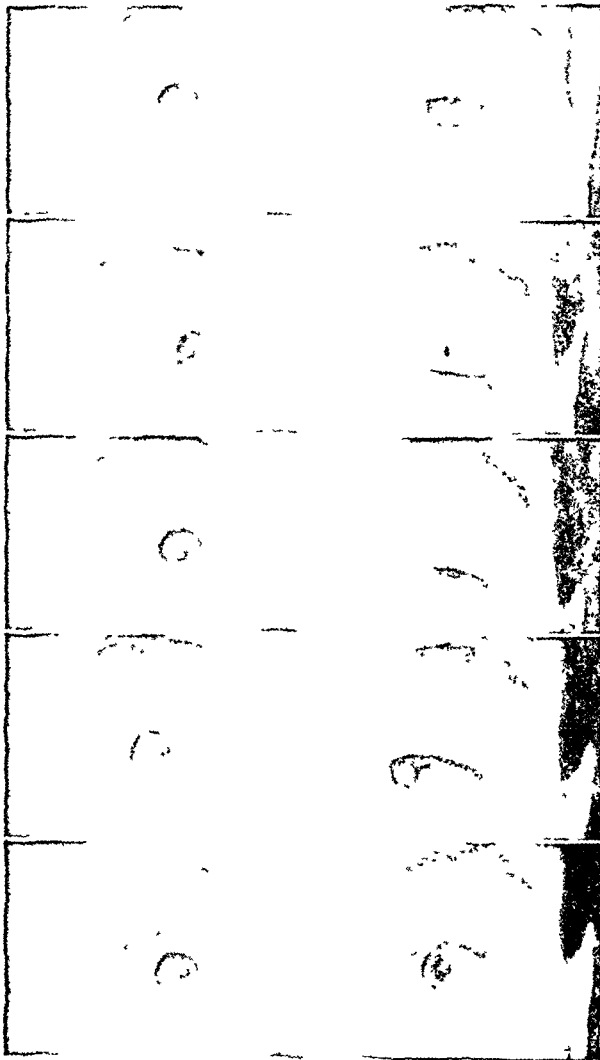


Fig. 1. Myasthenia with retraction of the right upper lid and ptosis on the left. The four upper pictures were taken before neostigmine was given. Note the lowering of the left upper lid when the eyes are directed to the left and the relative elevation of it when the eyes are directed to the right. The bottom picture was taken after a diagnostic injection of neostigmine. Note the marked retraction of the right upper eyelid and the increased width of the left lid fissure.



Fig. 2.—Myasthenia with left abducens palsy and ptosis. When the eyes are directed to the left there is abnormal elevation of the right upper lid.

## CASE 3

E.C.H. (12465).—Generalized weakness more pronounced in the ring and little fingers of both hands, followed by weakness of the lower jaw, choking, and difficulty in speaking, finally diplopia and occasional bilateral ptosis.

Muscles of the spine and abdomen may be affected. Muscular wasting is not commonly present and fibrillations do not occur. Wilson described changes in the tongue, which I have not observed personally: "A triple shallow longitudinal furrow is frequently found on the tongue, one running along the raphe and one on each side, midway between the former and the lateral edge". He also described tiring of the knee-jerk.

*Weakness of muscles of respiration.*—Weakness of the intercostal muscles and of the diaphragm is responsible for dyspnoea in myasthenics. Respiratory distress in some instances is apoplectic in its appearance and respiratory failure is the common cause of death.

*The influence of respiratory infections.*—Individuals who suffer from myasthenia gravis regularly suffer an exacerbation of the disease as a result of upper respiratory infection. There seems to be little or no parallelism between the severity of respiratory affection and the increase in the myasthenic involvement. Often we have observed such exacerbations without there being any difficulty in breathing whatsoever. Furthermore, when the respiratory involvement clears, the myasthenia gravis other than as affecting the diaphragm and intercostal muscles may persist undiminished in severity (see Case 6).

*The influence of pregnancy.*—Viets and his colleagues have found that if neostigmine controls the symptoms reasonably well during the first trimester of pregnancy a complete remission may be rather confidently anticipated during the second and third trimesters. My experience as regards pregnancy is limited to three cases. In two of these therapeutic abortion was performed during early pregnancy. In the other case labour seemed to precipitate the onset of myasthenia. The early signs appeared in unusual and interesting sequence.

## CASE 4

B.C.H. (56613).—Myasthenia gravis seemingly precipitated by normal labour in a 35-year old woman. Weakness of facial muscles with inability to close the eyes suggested bilateral facial paralysis. Within a few days there was development of myasthenic ptosis, difficulty in swallowing and regurgitation of fluids through the nose. Prostigmine therapy relieved all symptoms.

*Myasthenia gravis and hyperthyroidism.*—In our series of cases hyperthyroidism has been suspected in some instances when it was not present. In such cases there has been apparent protrusion of the eyes as a result of widening of the palpebral fissures. In other individuals hyperthyroidism has been present as well as myasthenia gravis. In the present state of our knowledge it is unwise to postulate any direct relationship between these two diseases. It is of interest that in both conditions the eye muscles may contain collections of lymphocytes (lymphorrhages). We have a single case in which medical and later surgical treatment for thyrotoxicosis seemed to influence the course of myasthenia gravis. The case is particularly

*Myasthenia gravis and dermatomyositis.*—We have observed an individual in whom myasthenia gravis was in a remission at the time of our examinations. A biopsy had seemed to establish the diagnosis of dermatomyositis (F.C. 383378). Particular attention is drawn to dermatomyositis because with it there is difficulty or inability to swallow in a large percentage of cases. Regurgitation of fluids results from spasmodic contraction of the upper end of the œsophagus. This symptom may be confused with regurgitation due to weakness of the palate in myasthenia gravis.

*Remissions in myasthenia gravis.*—In almost all cases of myasthenia gravis there is fluctuation of the symptoms. Complete remissions occur and in some instances last for years. In other cases improvement may develop although weaknesses persist. It is probable that in many instances what are considered as complete remissions are not really complete, but sufficient improvement has occurred that the affected individual has been able to take up his former occupation. The pattern of remission in myasthenia gravis has been studied by Kennedy and Moersch in 1937, and recently by Harvey.

Harvey's study was initiated to determine whether neostigmine therapy and thymectomy influenced the remission pattern. He compared what occurred in our series of cases with what was found by Kennedy and Moersch because neostigmine was not being used extensively in 1937 and in our series it has been used in almost all cases. Harvey remarked that in the early stage of the disease remission may occur and may last for periods up to 15 years, and as the disease persists the tendency to a lasting remission grows less. He found that only one patient had a remission lasting for two years or over after the advent of neostigmine therapy. Also he found that 60 of the 125 patients had not had a significant remission. He suggested that with neostigmine therapy there is less chance of a remission occurring than if such therapy is not given.



Fig. 3.—Myasthenia gravis which simulated bilateral internuclear paralysis. M.J.K. (Case 5).—The upper photographs were taken before the diagnostic injection of neostigmine. The lower photographs were taken after the injection. Note that she developed some capacity to converge.

interesting because the limitations of ocular movements resulted in a picture which closely resembled bilateral anterior internuclear ophthalmoplegia. It had been suggested there was a neoplasm involving the brain stem.

#### CASE 5

M.J.K. (407029).—Purely ocular myasthenia gravis resulted in combination of muscle palsies which suggested bilateral anterior internuclear ophthalmoplegia. Improvement of the ocular movements after neostigmine established the diagnosis. The patient exhibited evidences of hyperthyroidism. After prolonged treatment with thiouracil and iodine a subtotal thyroidectomy was performed. There was pronounced improvement within a few days. Within a few weeks the eyes were almost back to normal. Within six months the patient was able to resume full duties as a nurse. Six months after discharge the ocular movements were of full range.

#### EXAMINATIONS AND TESTS USEFUL IN THE DIAGNOSIS OF MYASTHENIA GRAVIS

Under this heading are described the various examinations and tests which are made on patients suspected of myasthenia gravis in the Johns Hopkins Hospital. The evaluation of the various tests is on the basis of personal ob-



servation and in large part my interests have been limited to studies concerning the eyes.

*The recording of data concerning the eyes.*—The width of the palpebral fissures is noted, both with the eyes held wide open and with them open and at rest. Using a perimeter and observing the corneal reflex the attainable movement of each eye is recorded in four directions, up, down, out, and in. The normal range is up 40 degrees, down 60 degrees, out 45 degrees and in 45 degrees. These readings are made again 20 to 30 minutes after injection of neostigmine.

*Neostigmine as a diagnostic aid.*—Viets properly has insisted that the standard test dose of neostigmine for adults should commence with 1.5 mgm. combined with 0.6 mgm. atropine. Lesser amounts are likely to produce equivocal responses, and larger amounts may produce alarming side-effects (intestinal cramps, diarrhoea, sweating, and shock from vagus action). Usually within 20 minutes after the injection an individual suffering from myasthenia gravis states that he feels stronger, and the examiner has no difficulty in determining an increase in the strength of the affected muscles. However, if it were always so this would be the only test required. There are several others which we have found useful in debatable cases.

Very recently (May, 1948) Merrill reported on neostigmine toxicity producing death. The patient, a white man aged 39, consulted his physician because of general weakness. As a therapeutic test, 1 c.c. of a 1:2,000 solution of neostigmine methylsulfate (0.5 mgm.) was given intramuscularly. A few minutes later a generalized convulsive seizure developed. Ten minutes after the injection salivation and respiratory difficulty appeared and the patient appeared severely shocked. In a further five minutes the pulse rate was 10 per minute and he required artificial respiration. Atropine sulphate, 0.4 mgm. was given. There then was some improvement in pulse and respiration but shock became more evident. Death occurred fifty minutes after the diagnostic injection of 0.5 mgm. of neostigmine. At autopsy the characteristic changes of shock were present: widespread capillary dilatation, edema and hyperemia of all the organs.

As regards the ocular muscles it is essential to know that the levator responds more readily than do the muscles attached to the eyeball. It is not unusual to miss the diagnosis because this fact has not been appreciated. As regards ocular myasthenia gravis in children it has seemed to us that these muscles are particularly resistant. We have demonstrated improvement in the extraocular movements in a child of three years only when an adult dose (1.5 mgm.) was given and this was sufficient to pro-

duce shock. Diplopia is rarely abolished by neostigmine. This statement is amplified in Part II.

Intra-arterial injection of neostigmine may be employed, particularly in individuals who exhibit weakness of the skeletal muscles rather than those of the eyes. This test was introduced by Harvey. In an adult 0.5 to 1.5 mgm. of neostigmine is introduced into the brachial artery after a cuff has been applied to the arm above the site of the injection. In the normal individual this produces a profound paralysis of the muscles distal to the cuff, also there are fasciculations in these muscles. When the cuff is removed fasciculations occur generally over the body. In the myasthenic patient such an injection of neostigmine produces increased strength in the muscles of the arm and there is

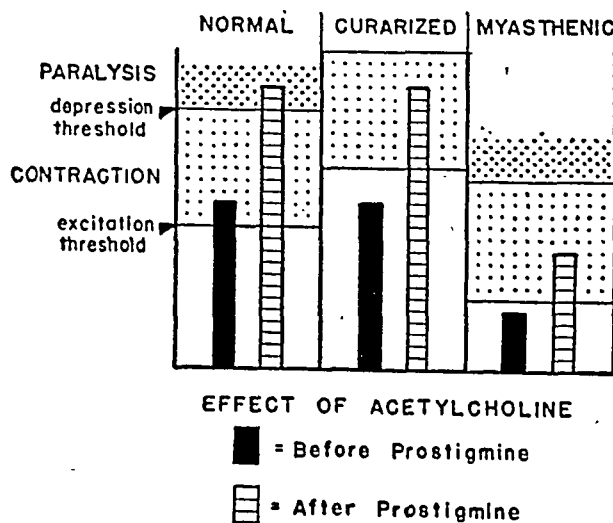


Fig. 4.—Examination of this figure explains the responses seen in normal individuals and myasthenics when neostigmine is injected into the brachial artery (from Harvey).

absence of fasciculations. As a confirmatory procedure this test is useful in a majority of cases because myasthenia gravis usually is a widespread disease.

*Curare.*—This substance occasionally may have value in the proof that an ocular myasthenia gravis exists. Dr. J. Lilienthal has shown that in ocular myasthenia a minimal dose of curare produces increased weakness of the extraocular muscles and nystagmus without having any other demonstrable effect. In such a case an injection of neostigmine quickly provides demonstrable improvement in the power of the extraocular muscles. Such improvement points to the myoneural junction as the site of the disorder. I have not used curare in the diagnosis of myasthenia gravis and con-

sequently am not in a position to evaluate its usefulness. On theoretical grounds it should have value. In the present state of our knowledge the test should not be used except under unusual circumstances.

*Quinine.*—Quinine has an action similar to that of curare. It has been suggested that a demonstrably unfavourable effect in cases of suspected myasthenia gravis may be valuable in supporting the diagnosis. As with curare, I feel that such a method of arriving at the diagnosis is usually best avoided except if there are doubts regarding a differentiation between myasthenia gravis and myotonic dystrophy. In such an instance the favourable response to quinine would support the diagnosis of dystrophy.

*Other substances.*—Substances which have decurarizing effect (potassium chloride, guanidine, calcium chloride) are useful as adjuvant therapy in occasional instances, but they are without value in establishing the diagnosis. They, also vitamin B<sub>12</sub>, did not influence the electromyograms of individuals suffering from myasthenia gravis according to Harvey and Masland. Ephedrine, which often is valuable as adjuvant therapy, has no real value in establishing the diagnosis.

*Creatinuria.*—Williams and Dyke in 1936 reported creatinuria as a definite evidence of myasthenia gravis. It is not now so considered. At this time there are no laboratory findings which bear on the diagnosis of myasthenia.

*Dynamometry and ergography.*—Such recordings before and after the injection of neostigmine are of great value in establishing or refuting the diagnosis.

*Fluoroscopy and roentgenography.*—In cases characterized by dysphagia observations of the swallowing of barium through the fluoroscope are extremely valuable, as has been described by Viets. Because of the weakness of the pharyngeal muscles the barium is incompletely swallowed before neostigmine is injected. After the injection of neostigmine the residual barium which has collected in the pyriform fossæ in large part passes on into the œsophagus and stomach. Viets has said that in no disease other than myasthenia gravis is the swallowing improved if it has been defective. Roentgenography of the anterior mediastinum for possible thymic mass should be a routine procedure.

*Electromyograms.*—In many cases we have found that recordings of muscle action potentials provide a graphic proof of myasthenia gravis. Harvey and Masland by stimulating the ulnar nerve in myasthenics, and with a lead off the little finger, produced proof of the favourable influence of neostigmine.

*Summary of tests establishing the existence of myasthenia gravis.*—In a majority of cases the final proof that myasthenia gravis exists rests solely on a demonstration of improved power in weak and readily fatigued muscles as a result of the injection of neostigmine. Dynamometry, ergography and electromyography before and after the injection provide recordable proof but only in rare instances are they essential to the diagnosis. An improved capacity to swallow after a diagnostic injection may be the only proof that myasthenia gravis is present in rare instances. I cannot recall any case in which the diagnosis rested solely on such a demonstration. Quinine and curare sensitivity are mainly of academic interest. At present it seems unwise to use these substances when myasthenia gravis is suspected unless the circumstances are exceptional.

In cases characterized by ophthalmoplegia measurements of the palpebral fissures and of the movements of the eyes should be recorded before and after the injection of neostigmine. Except when ptosis is present relatively slight improvement with the average test dose is the rule. Occasionally pronounced resistance to neostigmine is present.

*Is the neostigmine test infallible?*—From time to time individuals who are suffering from some disease other than myasthenia gravis give a weakly positive response to neostigmine. Viets has observed such responses in individuals suffering from amyotrophic lateral sclerosis, from bulbar palsy and from muscular dystrophy. We have observed a pronounced response in a boy who exhibited bilateral congenital ptosis; such a response was never elicited again although excessive amounts of neostigmine were used. It is safe to generalize that the diagnosis of myasthenia gravis is established when there is a pronounced response to neostigmine providing such response is reproducible.

*Is absence of response to neostigmine final proof in all cases that myasthenia gravis is an erroneous diagnosis?*—We have observed cases

in which the diagnosis of myasthenia gravis seemed obvious and yet there was essentially no response to neostigmine. It is of importance that in all such cases we have encountered, the alternate but untenable, diagnosis has been progressive bulbar palsy. This occasional absence of response to neostigmine emphasizes our lack of knowledge regarding the pathogenesis of this disease. It suggests that insufficiency of the acetylcholine mechanism occasionally is a factor of relatively slight importance. Cases 6 and 7 are of particular interest in this regard.

#### CASE 6

D.D.S., a white woman of 30 complained of inability to approximate the eyelids, and of occasional difficulty in swallowing with regurgitation of fluids through the nose. Her voice had a nasal twang and the face was without expression. She was firm in her statement that the eye condition remained constantly the same throughout each day. The extraocular movements were of full range.

Injections of neostigmine up to 15 mgm. produced no visible response. The patient experienced no sense of improvement. Neostigmine was given *per os* but she remained unchanged when the drug was discontinued. With the development of a severe cold she developed sudden pronounced difficulty in breathing. Neostigmine was given each three hours (1 mgm.). Undoubtedly it saved her life. Except for the respiratory symptoms there was no change in her condition. As the cold disappeared she rapidly improved as regards respiration. Thereafter she continued using neostigmine *per os* in small doses but essentially remained as when she was first seen.

#### CASE 7

E.B., (447509) (Case history, courtesy Dr. John T. King, Jr.) commenced having double vision, difficulty in keeping eyes open, difficulty in swallowing, occasional regurgitation of fluid through the nose, and inability to whistle, in 1930. She complained of difficulty in clearing her throat. These symptoms persisted until 1938 when she enjoyed an almost complete remission. After a few weeks the symptoms recurred and again in 1940 she seemed practically well for a few weeks. She was not having more difficulty than usual in 1948 and came to hospital in the hope that she might obtain complete relief.

Drs. King, Harvey, and Ford found pronounced weakness of the orbicularis muscles of each eye, weakness of the facial muscles and of the palate. The arms and hands tired rapidly. Injections of neostigmine failed to produce improved strength in the affected muscles but did produce some fasciculations.

### PART II. TREATMENT

Although this paper is not concerned with details regarding treatment by neostigmine and adjuvant substances it must be stated that requirements vary widely in different individuals and in the same individual at different times. Often too little neostigmine is prescribed. Viets enunciated two important rules in treatment. "First, maintain the patient adequately with prostigmin bromide, given by

mouth and properly spaced through the day and night. Second, bend every effort to carry the patient through a relapse, as a remission is sure to recur, if intercurrent infection or some other disaster does not overwhelm him." In emergencies the intramuscular or intravenous administration of neostigmine is indicated. In an interesting recent personal communication Viets indicated he was not in agreement that some individuals suffering from myasthenia gravis may be completely resistant to prostigmine. He cited the case of a man of seventy who required 3 mgm. intramuscularly every two hours and then enjoyed a sufficient remission during which moderate amounts of the drug by mouth sufficed (see Cases 6 and 7).

*As regards complaints concerning the eyes.*—Individuals suffering from the myasthenia gravis complain of diplopia, and ptosis, rarely of inability to close the eyes. Surgical operations on the eyelids and operations on the extraocular muscles are contraindicated. "Crutch" glasses to support one ptosed lid are useful; rarely both lids may be so elevated because usually the ptosis is associated with diplopia. Prisms have never been useful in my experience. Neostigmine therapy is usually of little or no value in these cases. This is because diplopia rarely can be abolished. Usually muscles in both eyes are affected even when the range of movements may seem full. When the neostigmine response develops although the eye muscles are stronger the relative differences in strength persist, hence the persistence of the diplopia.

*Thymectomy.*—That tumour of the thymus may be associated with myasthenia gravis has been known for a long time. Since 1941 extirpation of the thymus has been employed as a method of treatment. In our experience only recently has the operation been performed in relatively mild cases. What relationship there is between thymus tumour, thymus hyperplasia, and myasthenia gravis is not known. Several reports are available for study. Keynes reported on 51 cases in which thymectomy was performed. He made an interesting point that malignant thymus tumours which are associated with myasthenia gravis are invariably epithelial in origin. Keynes in 51 cases found 6 thymomas. Blalock in 20 cases found 2 thymomas. Of Keynes' 51 patients 13 were dead when his report was written. Of 33 patients 9 were well;

11 were improved; 8 were somewhat improved; and 3 were too recently operated upon to be classified.

Harvey recently reported on 32 cases subjected to thymectomy since 1941. There were 10 deaths following operation; three were immediate and seven occurred subsequently. Of 29 patients six showed almost complete remission of symptoms; seven had a partial return of strength; five showed slight but definite and continuing improvement; in nine the course of the disease was not changed. Viets reported on 15 cases. Following operation there were four deaths. Of 10 patients two were in complete remission; two were improved; three were moderately improved; three were too recent to evaluate.

From what is stated above it is apparent that the results of thymectomy are variable. It would seem that Keynes' cases responded rather better than those reported by Viets and those studied by Harvey. However, several factors require consideration. The most important of these is that remissions occur in many cases of myasthenia gravis when no treatment is given. In some of these reported cases the classification "somewhat improved" is extremely loose. With individuals suffering from myasthenia gravis psychic responses often require evaluation. This is exemplified by an individual who attributed improvement to thymectomy. Actually, at operation it was impossible to locate thymus tissue, and examination failed to reveal demonstrable decrease in the involvement of the extraocular muscles. Although the number of cases studied after thymectomy is small, it seems established, particularly by Keynes' report, that thymectomy is effective in some cases. The indications indicating the advisability of operation are by no means clear.

Harvey's studies have brought two important considerations regarding treatment into focus: both concern thymectomy. He noted that three of our patients who had been subjected to thymectomy for benign thymoma died within a year without having enjoyed a remission. These cases suggest that thymectomy, under this circumstance, may have a harmful influence on the myasthenia. He cited a case which indirectly supports this viewpoint. A 39-year-old woman, who exhibited ophthalmoplegia and dysphagia as principal evidences of myasthenia, was shown by x-rays to have a thymus tumour. With the

aid of neostigmine therapy she enjoyed a fairly normal life during nine years she was under observation. However, since our series contains other cases in which removal of thymoma seemed to produce varying degrees of remission, it is obvious that further observations regarding thymectomy for benign thymoma are necessary. If the relationship which Harvey has suggested becomes established selection of cases for thymectomy would become almost impossible. It is always difficult and sometimes impossible to differentiate between thymoma and thymus hyperplasia.

In our series Harvey noted that significant remissions lasting for a long time are unusual in patients who have received moderate or large amounts of neostigmine for over six months. Also he observed that significant remissions tend to occur early in the course of the disease. On the basis of these observations he has suggested that thymectomy to have its maximum chance of benefit should be done early. Viets, in a recent personal communication, remarked upon excellent results of thymectomy in two of four patients all of whom had suffered from myasthenia for several years before operation.

Harvey's suggestion that a long term study of thymectomy be done early in the course of the disease seems entirely sound. It would seem reasonable that since all observers are convinced it does good in some cases it is probably unsound to reserve operation only for late and severe cases. We have observed recurrence after thymectomy which seemingly had provided a remission.

#### CONCLUSIONS

1. The pathogenesis of myasthenia gravis remains obscure.
2. A knowledge of the ocular signs is a necessary prerequisite to correct diagnosis in this disease.
3. Concerning the ocular signs the following principle of diagnosis is offered: in cases characterized by external ophthalmoplegia if a diagnosis other than myasthenia gravis is not crystal clear a diagnostic injection of neostigmine is indicated. Atropine should never be omitted.
4. Response to neostigmine is variable and requires experienced observation in some cases. A positive response, if it is pronounced and reproducible, almost certainly indicates the diag-

nosis of myasthenia gravis. In rare instances the individual with myasthenia gravis may be essentially neostigmine-resistant (see Cases 6 and 7).

5. A response to neostigmine may be obtained in non-myasthenics: bulbar palsy, amyotrophic lateral sclerosis, muscular dystrophy, (Viets), congenital ptosis (Walsh), but such responses are weak and at least in the condition last named, are not reproducible.

6. A possible relationship between myasthenia gravis and hyperthyroidism may ultimately be elucidated.

7. The treatment of ocular symptoms with neostigmine except in occasional instances is unsatisfactory.

8. As regards thymectomy it is established that the operation has real value in some cases.

9. Indications for thymectomy are unclear and urgently require further study.

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### NORTH AMERICAN BLASTOMYCOSIS\*

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SINCE the original finding of yeasts in the biopsy of a verrucous skin lesion, by Gilchrist, in 1894, and the detailed description of a case of North American blastomycosis by Gilchrist and Stokes<sup>1</sup> in 1896, numerous reports have appeared in the literature describing the clinical, mycological, immunological and patho-

logic features of the disease. Much of the credit for our present-day knowledge of blastomycosis must be given to the group at Duke University School of Medicine. Two recent reviews of the literature are available.<sup>2, 3</sup> It is now known that blastomycosis occurs in two forms, cutaneous and systemic. The etiological agent is the fungus *Blastomyces dermatitidis*, which may attack any organ, but has a special predilection for the skin, lungs and bones.<sup>4</sup>

*Cutaneous blastomycosis* is characterized by the formation of single or multiple chronic granulomatous ulcers (Figs. 1 and 2), usually of the exposed surfaces such as the head, arms and legs. The portal of entry is the cutis and there may or may not be trauma attending the onset. The lesion begins as a reddish papule which undergoes ulceration, with the discharge of pus or sero-sanguineous material. It spreads centrifugally; the margins are raised, serpiginous, indurated, often slightly crusted, and are surrounded by a dusky erythema. The disease is locally debilitating, but usually general health is unimpaired.

By contrast, *systemic blastomycosis* is a highly fatal disseminated infection, with the respiratory tract as portal of entry and a pulmonary lesion the focus of dissemination. The disease may spread locally, or by lymphatics, or by the blood stream: 92% of cases of systemic blastomycosis followed for two years were fatal.<sup>4</sup> It is not uncommon for cases with systemic blastomycosis to have skin lesions, but it is rare for cutaneous blastomycosis to assume the generalized form.

*B. dermatitidis* may be found in the discharges of the lesions, including sputum, in scrapings of the ulcers, and in tissue sections. It is a doubly-contoured budding yeast, in which single buds only develop from the parent cell. It grows readily on Sabouraud's medium. At room temperature a filamentous mould form grows, but at 37° yeast-like colonies are produced.<sup>4</sup> It is to be distinguished from *B. braziliensis* and *Cryptococcus neoformans*, the etiological agents of South American and European blastomycosis respectively. The diagnosis is proved by culturing *B. dermatitidis* from the lesions.

Pathologically, blastomycosis is a suppurative granuloma in which miliary abscesses, composed of polymorphonuclears, cell debris and budding yeasts, are the most typical findings. Fibroblastic proliferation, giant cells, epithelioid cells, and chronic inflammatory

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† Unless otherwise specified, the term blastomycosis will be used to indicate North American blastomycosis throughout this paper.

cells occur in varying proportions in different situations. Around the cutaneous ulcers epithelial hyperplasia is seen (Fig. 5). Caseous necrosis has been described in pulmonary lesions.

In a review of the literature Martin and Smith<sup>2</sup> studied 347 case reports from the United States, Canada and England. Eighty were proved cases of blastomycosis, 163 were presumptive and in 104 the description was too brief for them to be included among the presumptive cases. Of the proved and presumptive cases, 92% originated in the United States. Of seven cases reported from Canada, one was proved,<sup>3</sup> five were considered presumptive,<sup>6, 7</sup> and, in one, the description was too brief for inclusion with the presumptives.<sup>8</sup> In addition, Beregoff-Gillow<sup>9</sup> reported finding yeasts in pure culture of the sputum in two cases. In one of these the yeast was of the genus *Blastomyces*. However, case reports were not included. McKee<sup>10</sup> made notes on blastomycosis of the eye, and showed a photograph of a case, but included no proof that the lesion was mycotic in origin. Gaumond<sup>11</sup> reports a fatal case from which a yeast resembling blastomyces was cultured. It was not identified with certainty. A search of the literature between 1939 and 1947 fails to reveal further cases of blastomycosis reported from Canada.

It is the purpose of this paper to record nine cases of blastomycosis from the files of the Toronto General Hospital between the years 1929 and 1948, and to discuss the pathological features of one of these. Using the available histories, bacteriological and pathological reports, clinical notes and photographs, seven cases are considered proved and two (Cases 1 and 4) presumptive.

#### CASE 1

H.L., a 39-year-old native Canadian and a resident of Toronto, was admitted to the hospital August 26, 1929. He was employed as a printer. He complained of an ulcer of the right hand of four months' duration. Six weeks before admission he developed a tender swelling of the right side of the neck, below the ear. He had pain in the left calf of the same duration.

Past history revealed that he had been treated for primary syphilis in 1921. On examination he was somewhat pale. There was a non-fluctuant 4 cm. mass in the neck on the right side, 4 cm. below the ear. There was a diffuse swelling of the calf of the left leg over the gastrocnemius muscle, with brawny induration of the deeper tissues.

On the dorsum of the right hand was an indurated, deep red, margined ulcer which was non-tender. Pus exuded from the lesion. The base of the ulcer was 2.5

cm. in diameter. Laboratory examination revealed; Hb. 67%; red blood cells 3.8 million; blood Wassermann negative; spinal fluid Wassermann positive.

The swellings of the neck and leg were drained surgically. Bacteriology reports are not available. Both yielded considerable quantities of pus. A biopsy of the hand was reported as follows, "The epithelium shows a considerable amount of proliferation. Beneath the epithelium there is a marked inflammatory reaction, as evidenced by the presence of endothelial cells, lymphocytes and polymorphonuclears. In some instances the endothelial cells form giant cells. Scattered throughout this area of inflammatory reaction were found many doubly-contoured bodies which exhibited budding". A diagnosis of blastomycosis was made.

The patient was treated with potassium iodide, gm. 6 daily, and with intravenous gentian violet 0.25 gm. on four separate occasions. The lesions healed with the exception of a small draining sinus in the neck which was touched with copper sulphate stick.

He was re-admitted in November, 1929, with a small ulcer of the anterior axillary fold. This responded to similar therapy. When last seen in 1943 he was free of evidence of blastomycosis.

#### CASE 2

W.T., a 32-year-old native Canadian, was admitted to the hospital December 15, 1930. He was a resident of Toronto and was a schizophrenic of several years' duration. He complained of swelling on the outer side of the right foot which had been present for three months.

Physical examination was negative apart from the mental condition and the local lesion. On the outer and under aspect of the right foot was a raised, sharply defined area, 2 x 3 cm. The region was ulcerated and reddish in colour. The edges were somewhat crusted. A single enlarged inguinal gland was present. Blood Wassermann was negative, white blood cells 15,500, and Hb. 100%.

Biopsy of the lesion was reported on as follows, "The epithelium is hypertrophied. The corium is heavily infiltrated by polymorphonuclears, lymphocytes, plasma cells, eosinophiles and endothelial cells. In the areas of heavy polymorphonuclear infiltration can be seen yeast cells. They appear as spherical bodies 15 microns in diameter, and have a well-marked double-contoured cell membrane. Some of these show budding".

*B. dermatitidis* was identified on direct examination and on culture of the lesion. The patient was treated by implantation of radium needles and, later, x-ray therapy. However, there was no improvement during the course of a year and he developed similar large ulcers on the anterior aspect of the leg and medial aspect of the knee. Mid-thigh amputation of the right limb was undertaken in view of the blastomycosis which failed to respond to therapy. Following this he was well until June, 1932, when he was re-admitted with a blastomycotic lesion of the dorsum of the right hand. This was excised locally and healed readily.

He was re-admitted in August, 1932, with a papillomatous, warty lesion of the right side of the face. This was biopsied and reported as blastomycosis. It was excised, with subsequent healing. In November, 1932, he was again re-admitted with blastomycotic lesions of the right hand, right cheek, left hand and both buttocks. He failed to respond to treatment and was placed in an institution for the chronically ill.

#### CASE 3

W.D., a 62-year-old native Canadian, was admitted to hospital August 25, 1936. He lived in rural Ontario and was employed as a storekeeper. He complained of ulcers of the leg of ten years' duration. Ten years before admission he developed a reddish "pimple" of the

left thigh. This became ulcerated and gradually larger. It subsided spontaneously in three years. Two weeks following the initial lesion, he suffered a contusion of the right ankle and a hematoma resulted. This was incised by his doctor and some blood drained. Following this he developed a reddish "pimple" at the site of incision which broke down forming an ulcer. Others appeared and soon a number of ulcers were present on the leg, extending to the knee. Some of these healed spontaneously, only to have others appear at new sites. All started as a raised red papule. The leg ached from knee to toes.

Physical examination was negative except for the local lesions. Several large ulcers of the right leg were noted. One, on the dorsum of the foot, extended from the base of the toes to the lateral malleolus. There was a small ulcer on the lateral aspect of the ankle. There was a large ulcer over the upper third of the leg. The intervening skin was thickened and scaly. The margins of the ulcers were heaped up, crusted and rolled in. There was a greyish exudate around the



Fig. 1. (Case 3).—Serpiginous thigh ulcer with peripheral crusting. Fig. 2. (Case 3).—Multiple superficial ulcers of the leg and foot. The intervening skin is thickened and scaly.

periphery. The bases of the ulcers were red but partially covered by grey exudate. A small ulcer was present on the lateral aspect of the right thigh.

The urine was negative; Hb. 74%; white blood cells 12,000; blood Wassermann negative. Pus from the ulcer on fresh examination showed "yeast cells with double-contoured walls. They reproduce by budding and show the characters of *B. dermatitidis*."

Biopsy report of one of the ulcers was as follows. "There is considerable ulceration, with fibrin, cellular debris and hemorrhage on the surface. The intact epithelium is hypertrophied. Lying in the corium are numerous milium abscess cavities. These are filled with polymorphonuclears, lymphocytes, endothelial cells and giant cells. Some of the abscess cavities contain small, spherical, doubly-contoured budding yeasts". A diagnosis of blastomycosis was made.

He was treated with moist antiseptic dressings locally, and potassium iodine orally, with almost complete healing of the ulcers and was discharged to his home. He was readmitted five years later, in September, 1941, with recurrence and spread of the ulcers, particularly around the gluteal region and knee. The former ulceration was 24 x 15 cm. The knee joint was completely encircled. He was started on treatment with

potassium iodide orally, but signed himself out of the hospital in a short time and was not again observed at this hospital.

#### CASE 4

A.E., a 62-year old native Canadian, had lived in rural Ontario all his life except for five years of childhood, which were spent in California. He was referred to the hospital in January, 1937.

He stated that in 1936 he developed a pea-sized lump on the anterior border of the right ear at the mid-portion. The lesion was treated without improvement for six months by his family physician. Upon admission to the clinic of the Toronto General Hospital, a biopsy was taken. The lesion was reported as "infected papilloma". He was treated with 75 mgm. hours of radium and the lesion disappeared.

Six months later a similar lesion occurred below the site of the first, anterior to the tragus. This became enlarged to involve the tragus, the concha, and the outer portion of the external auditory meatus. Within four months a similar area appeared at the upper border of the ear, extending gradually to involve the anterior part of the helix and adjacent scalp and face. A biopsy at this time (January, 1938) was reported as follows; "This is a papillomatous lesion in which the stratified squamous epithelium is thrown up into several large blunt folds, supported on a delicate, well-vascularized stroma. Within the latter there is a heavy lymphocyte and plasma cell infiltration. In a number of areas there are small pockets of polymorphonuclears and among them doubly-contoured budding yeasts are seen." The diagnosis was blastomycosis.

He was treated with further radium therapy and was admitted to hospital in December, 1938. At the time of admission, there was an ulcerative lesion involving the skin of the side of the face, the skin below and medial to the lobe of the ear, and the inner surface of the lobe of the ear. This last-named site was in contact with the adjacent skin of the neck, and considerable pain resulted. The lobe of the ear was removed and other parts of the ear trimmed off. The area of papillomatous skin involvement above the ear was destroyed by diathermy and a 2 cm. area of skin anterior to the ear was destroyed as well. This was followed by a course of x-ray therapy. Subsequently, the patient developed stenosis of the external auditory meatus, and mastoiditis for which mastoidectomy was performed. He was last seen in the hospital July, 1940, at which time the lesion of the ear was not completely healed.

#### CASE 5

A.H., a 28-year-old native Canadian, resident in Toronto, was referred to the hospital April 8, 1937. On admission he stated that he had been well until three months ago. At that time he developed a small red area on the medial aspect of the right elbow. It was tender on palpation. His family physician incised the lesion, obtaining a small amount of pus, but the lesion failed to heal. Six weeks before admission he developed a similar red papule on the inner side of the right arm at its mid-point. This was also incised with the same result. Three weeks before admission he noticed a tender swelling in the jugular notch. Applications of moist heat failed to improve the last lesion.

Apart from pneumonia and empyema in 1929, past and personal histories were negative. Physical examination was normal except for the local lesions.

On the inner aspect of the right elbow there was a raised, reddened, non-tender area 2 cm. in diameter. The centre was ulcerated and the edges indurated. At the mid-point of the arm, on the inner aspect, was a small round ulcer, 1 cm. in diameter, surrounded by a red indurated area. There was swelling near the jugular notch. The tissues were red but only slightly tender. The urine was negative; Wassermann negative; Hb. 92% and white blood cells 11,500.

On April 12, definite fluctuation was present in the neck and, accordingly, surgical drainage was undertaken. Coincidentally, smears and biopsies of the arm lesions were taken. Smears from the three sites were reported as showing "many pus cells and a moderate number of budding yeasts typical of *B. dermatitidis*". Cultures yielded *B. dermatitidis*. The pathological report read: "Sections of the skin show it to be covered by a hyperplastic layer of stratified squamous epithelium. The subjacent corium is the site of an inflammatory reaction in which neutrophils, plasma cells and eosinophiles are present. In several areas small, doubly-contoured, budding yeasts are observed. There is proliferation of endothelial cells and foreign body giant cells of the multinucleated variety are present."

In hospital the patient developed a third lesion of the arm at the anterior axillary fold. He was placed on increasing doses of saturated solution of potassium iodide up to a maximum of 6 c.c. daily. He received x-ray therapy to all sites with subsidence and disappearance of the lesions.

During 1938 he developed a blastomycotic ulcer of the left thigh which was similarly treated. When last seen in November, 1939, he was completely well.

biopsy taken from the edge of the lesion on the face showed ulceration of the stratified squamous epithelium, with hypertrophic changes of the intact margins. In the corium, miliary abscesses, containing polymorphonuclear leucocytes and doubly refractile budding yeasts, were seen. A diagnosis of blastomycosis was made. No cultures were made. The patient received a saturated solution of potassium iodide, 3 c.c. daily, and x-ray therapy to the face and ear. The lesions healed and the patient was well when last seen in the clinic August 19, 1941.

#### CASE 7

C.S., a 28-year-old native Canadian, employed as a motor mechanic, was seen in the out-patient department April 1, 1941. He complained of a chronic ulcerative lesion of the cheek under the right eye of one year's duration. A 2 cm. oval lesion, with ulcerated centre and slightly raised, indurated edges, was present under the right eye.

Scrapings of the lesion examined in the fresh state revealed "budding yeast cells with doubly refractile walls, the morphological appearance of which is typical of *B. dermatitidis*". Culture of the same material grew

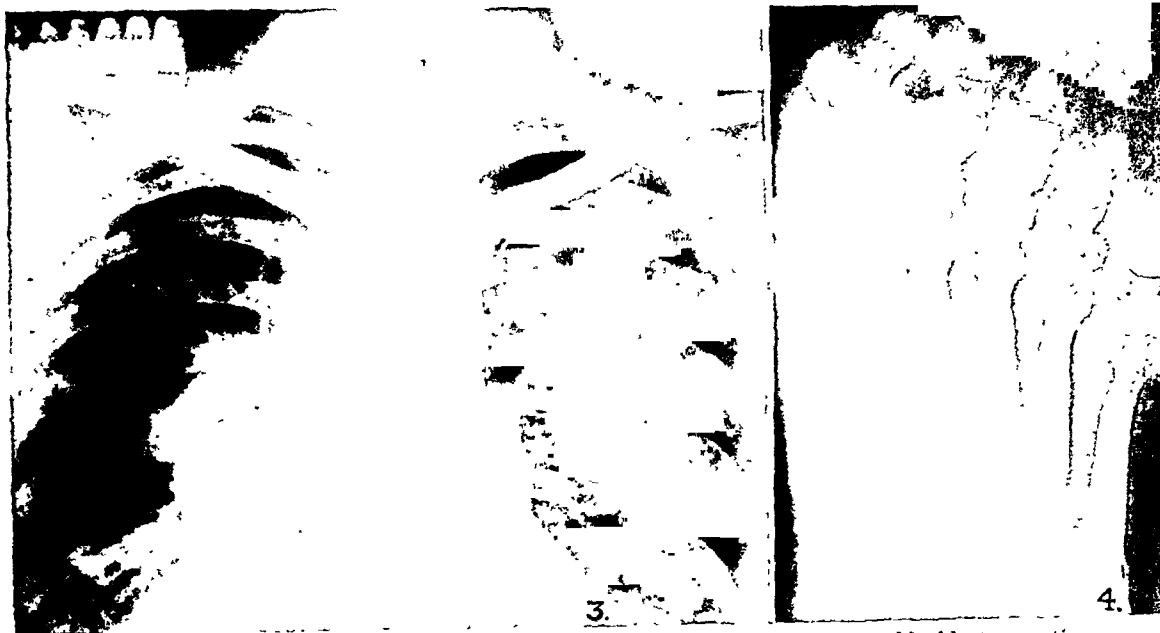


Fig. 3. (Case 8).—Infiltration at the hilum of the right lung, presumably blastomycotic in origin. Fig. 4. (Case 8).—Osteolytic lesion of the first phalanx of the great toe.

#### CASE 6

W.K., a 64-year-old native Canadian was admitted to the out-patient department March 25, 1941. He had lived in rural Ontario all his life and was employed as a farm labourer. He complained of a lesion of the right cheek, 2 cm. in diameter, and one of the lobe of the right ear, 0.5 cm. in diameter. Both started as reddened papular areas which became ulcerated, slightly crusted, and exuded a small amount of purulent material. His general health was good.

On examination the lesion of the right cheek was 2 cm. in diameter, slightly raised and crusted with an irregular periphery where small abscesses were situated. A small amount of serum exuded on pressure. The lesion of the ear was similar. General physical examination was negative. Blood Wassermann was negative.

Scrapings from the face lesion were mounted in 25% sodium hydroxide and examined. Doubly-contoured budding yeasts, typical of *B. dermatitidis*, were seen. A

fungus which was identified as *B. dermatitidis*. Biopsy of the edge of the lesion showed a hyperplastic epithelium with miliary abscesses between the down-growing pegs of epithelium. There were a few giant cells present at the edges of the abscesses. Doubly-contoured, budding yeasts were found in the abscess material. A diagnosis of blastomycosis was made.

The patient was treated with a saturated solution of potassium iodide 12 c.c. daily. The original lesion extended to involve the side of the nose and the upper eyelid. He then received x-ray therapy to each area. All lesions except the upper eyelid subsided and healed. The lesion of the upper eyelid gradually extended to a length of 4 cm., in spite of continued x-ray therapy. Ectropion of the lower lid developed.

The lesion of the upper lid was excised surgically. Between January, 1943, and February, 1946, he underwent three reconstructive procedures to the eyelids with improvement. When last seen in 1946 there was no clinical evidence of blastomycosis.



## CASE 8

Miss A.P., a 69-year-old native Canadian living in Toronto, was referred to the hospital May 29, 1945. She stated that in July, 1944, a red "pimple" developed in the skin of the right breast, lateral to the nipple. This lesion ulcerated and failed to heal. It was excised by her physician. In the following months, the ulcer reappeared and similar lesions developed on the left shoulder and the great toe. In February, 1945, she noted the onset of a cough, with expectoration, and had several mild attacks of haemoptysis. One month before admission she had a superficial pimple of the right cheek, over the zygomatic bone. This slowly increased in size, broke down and discharged intermittently.

On admission, there was a large swelling over the zygomatic bone, measuring 2.5 x 1.5 cm. The central area was covered by a greyish crust. Peripherally there were small vesicles present which discharged serous



Fig. 5. (Case 5).—Epithelial hypertrophy and inflammatory infiltration of the dermis. x60. Fig. 6. (Case 9).—"Blastomycetic tubercle", showing a central necrotic area surrounded by epithelioid cells and granulation tissue. One giant cell is visible. x150.

material on pressure. The area was tender and itchy. Over the left shoulder, posteriorly, was an ulcerated lesion 2.5 cm. in diameter, with a granulating base and elevated serpiginous edges. The skin of the right breast showed a similar ulcer measuring 1 cm. in diameter. The left great toe was the site of a granulomatous ulcer which extended from the base of the nail proximally for 1 cm. and around the sides of the nail in a horseshoe-shaped manner. Small amounts of serum exuded from the lesion. X-ray of the chest revealed a circum-scribed density at the right hilum which faded into the periphery (Fig. 3). X-ray of the left great toe showed an osteolytic lesion of the terminal phalanx (Fig. 4).

The patient had an intermittent fever daily up to 101° F. The urine was negative; Hb. 74%; white blood

cells 9,800; sedimentation rate 110 mm. per hour (Westergren). Scrapings of the lesion showed "a few budding yeast cells with double-contoured walls typical of blastomyces". Cultures on two occasions grew *B. dermatitidis*. No yeasts were seen on direct examination of the sputum. Biopsy of the skin of the shoulder region showed numerous milium abscesses in the corium composed of polymorphonuclear leucocytes. Doubly-contoured budding yeasts were seen in the abscesses. Surrounding the abscess spaces was a granulomatous reaction in which giant cells, lymphocytes, and plasma cells were present in large numbers.

A diagnosis of blastomycosis was made. Although the pulmonary lesion was not proved to be blastomycotic, it was considered as such clinically. The patient received x-ray and radium therapy to all lesions, with improvement of the breast, shoulder and toe. The lesion of the face extended medially to the bridge of the nose and inner canthus of the eye. She also developed a new lesion of the lateral aspect of the left thigh. In the period from June, 1946, to June, 1947, she developed a

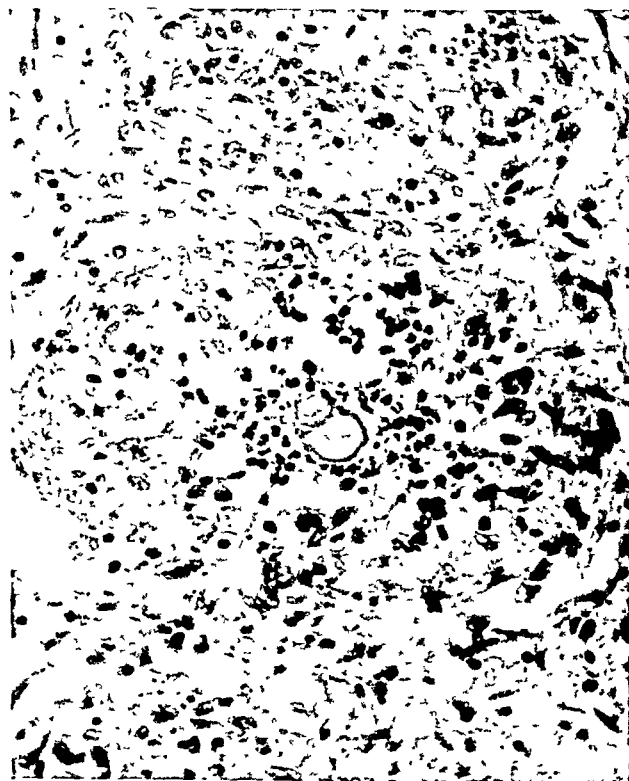


Fig. 7. (Case 9).—"Blastomycetic tubercle" with the doubly contoured budding yeast lying in the central area. x300.

lesion of the right parotid area which subsided with treatment. The pulmonary lesion diminished in size under therapy. There was increased bony destruction noted in the proximal and distal phalanges of the toe, although clinically the skin was responding well.

By October, 1947, all lesions were clinically healed and she had no complaints other than ectropion of the right eye due to scarring. At the time of writing she is still under observation.

## CASE 9

D.T., a 17-year-old native Canadian, was admitted to the hospital March 13, 1948. He lived in rural Ontario and was employed as a carpenter's helper. He complained of swelling and ulceration on the lateral aspect of the right heel, of five months' duration.

In November, 1947, he jammed the right heel between a door and a wall and sustained a mild contusion without

laceration. The region became swollen and painful and was immobilized in plaster by his family physician. In two weeks pain was still present. The cast was removed. X-rays at this time suggested periosteal reaction and osteomyelitis was suspected. The area was incised, curetted and plaster was re-applied. However, the plaster cast was removed in 24 hours because of discomfort. At this time considerable serosanguineous discharge was noted from the operative wound. It failed to heal and a pouting granulomatous ulcer developed.

On admission to hospital physical examination was negative except for the local lesion. Around the right lateral malleolus, and inferior to it, there was a large granulating ulcer, heaped up above the skin margins, which measured 4.5 x 3 cm. There was atrophy of the right thigh and calf. Hb. was 92%; white blood cells 7,200. Blood Wassermann was negative. Cultures from the ulcer grew *Staph. aureus* and *B. dermatitidis*. Biopsy of the lesion showed many miliary abscesses containing neutrophils and surrounded by dense granulation tissue. In the abscesses many doubly-contoured budding yeasts were seen. The granulation tissue was infiltrated with plasma cells, eosinophils and lymphocytes. A moderate number of giant cells were seen.

The patient was treated with a saturated solution of potassium iodide, 5 c.c. per day, but the lesion showed no sign of regression. On April 8, a wide excision of the lesion was undertaken. At operation the calcaneus was found to be involved and several fragments of bone were removed. A detailed pathological study of the lesion was carried out. Following operation a vaccine from the growth of *B. dermatitidis* was made with a view to hyposensitizing the patient and then continuing therapy. The patient was under treatment at the time of writing.

## DISCUSSION

Blastomycosis is a disease which attacks all age groups, but the highest age incidence in the series reviewed by Martin and Smith was during the fourth decade. The ages of the patients described above ranged from 16 to 69 years. The average age was 49 years. Only two of the cases were between 30 and 40 years of age at the time of admission. Blastomycosis is not common in males, the ratio being 9:1.

The series described conforms to this, in that 9 of 8 males and 1 female.

In 12 cases the disease was associated with mental hygiene, notably with cellulars. The data are inconclusive in determining the incidence in this series. The patients lived in urban areas, Ontario. There was no denominator for the disease. The incidence was not geographically dependent.

The fungus was found in 12 cases. The findings are in agreement with or

without added potassium hydroxide, may be carried out as an office or ward procedure, and should be done early in suspicious cases. Culture and tissue biopsy are special investigations which require the services of a laboratory.

It is not the intention of this paper to discuss therapy, but iodides, x-ray and surgical excision may be used singly or in combination. The method of desensitizing patients with increasing doses of a standard vaccine prepared from a culture of *B. dermatitidis*, prior to iodide therapy, deserves consideration. The reader is referred to Conant<sup>1</sup> for a discussion of the method.

All reports dealing with the histopathology of infections by yeast-like bodies give prominence to the occurrence of lesions resembling tuberculosis.<sup>13</sup> Medlar<sup>14</sup> emphasizes this similarity in a report of two cases of systemic blastomycosis. Baker<sup>15</sup> concludes that in human blastomycosis the lesions are primarily pyogenic, with prominence of polymorphonuclear leucocytes. Some lesions, especially in the systemic group, closely resemble tuberculosis. In cutaneous cases the organisms are usually moderate in numbers and caseous necrosis is usually absent. The lesion is composed of miliary abscesses, granulation tissue and hyperplastic epidermis.

Most authors agree with the above statements, being careful to differentiate the pathologic features of systemic and cutaneous blastomycosis. In one of the cases in this series (Case 9), where wide excision of the lesion was undertaken, one of the chief pathological features deep in the corium was the presence of many "blastomycetic tubercles" (Figs. 6 and 7). These tubercles were characterized by a central abscess composed of polymorphonuclears around which many epithelioid cells and giant cells were arranged in palisaded fashion. The "tubercles" were separated by areas of dense granulation tissue which contained many eosinophiles, plasma cells and lymphocytes. This finding is in agreement with the original description of blastomycosis by Gilchrist and Stokes,<sup>1</sup> who stated that tubercle-like formations were observed deep in the corium.

The fact that skin biopsies are generally superficial and small may account for the widespread view that there is a considerable differ-

ence in the pathology of the two types of the disease. It is suggested that if it were possible to examine all the cutaneous lesions fully the finding of tubercles would be of much more frequent occurrence. Moreover, it seems reasonable that the response should not differ markedly in different areas of the body.

#### CONCLUSIONS AND SUMMARY

Blastomycosis is probably more common in Canada than is generally recognized. It should be suspected in obscure pulmonary disease and chronic ulcerative skin lesions. Early diagnosis by smear and scrapings from the lesions, and carefully controlled therapy, offer the best chance of permanent cure.

Nine cases of North American blastomycosis have been reported. They were observed in the Toronto General Hospital between 1929 and 1948. Notes on the histopathology of one case are included.

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RECENT ADVANCES IN TREATMENT OF LYMPHOMAS, LEUKEMIAS AND ALLIED DISORDERS. Craver, L. F., *Bull. New York Acad. Med.*, 24: 3, 1948.

The accomplishments in the treatment of lymphomas and leukemias may be listed as follows: (1) an improvement in palliative results measured both in relief of symptoms and by survival curves in Hodgkin's disease, lymphosarcoma and chronic lymphatic leukemia by roentgen irradiation as a result of greater precision in distribution of lesions and in their treatment; (2) additional ways of palliation by means of nitrogen mustards for Hodgkin's disease, and some cases of lymphosarcoma and leukemia, by means of urethane for some cases of leukemia, and by means of stilbustidine for multiple myeloma.

## GUNSHOT WOUNDS OF THE GENITALS

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THIS review is based upon experience with war wounds of the genitals accumulated during the campaign in northwest Europe. The cases were all operated on at a 600 bed hospital, which received surgery from the field. There were twenty major genital cases, which form the basis of the paper.

These wounds are not numerous in comparison with war wounds in general, and, when they occur, they are frequently only a part of the multiple wounds with which the surgeon must deal. Soldiers operated upon were always kept in hospital until such time as the sutures could be removed and then they were evacuated. This procedure was adopted because primary suture was carried out and because of our wish to assess results and methods.

Genital wounds are of very great importance and primary suture is the method of choice. The soldier who knows he has had a bad genital wound is usually quite depressed. Most men have a secret dread of being hit in the genitals, and this depression and worry lasts for several days after wounding. These men need assurance before operation and when seen after surgery has been done. They have many worries which are not necessary and a word or two can clear their minds and improve their morale. Once things go well and they know their problem, they become as good patients as any other soldier and they make light of their injury.

It is not intended to list all of the operative procedures carried out in each of the twenty cases of major injury of the genitals under review; but rather to discuss principles that were emphasized by cases which seemed to merit a special word and from which some new experience was gained. The operation in each case is essentially thorough wound excision and primary suture; with urinary diversion when it is indicated.

X-ray films are very helpful, if they can be obtained. It is remarkable how quite a large piece of metal can be missed in palpating a large scrotal hæmatoma, and a bullet can come

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\* Being a paper read at the Urological Section of the Canadian Medical Association Meeting, at Banff, 1946

to rest in the urethra when there are obvious signs of wounding elsewhere.

A soldier was hit by a machine gun bullet in the upper lateral aspect of the left thigh; the femur was fractured in its upper third; the perineum showed some tenderness and there were a few drops of blood at the meatus. X-ray films showed a bullet in the midline of the perineum. The thigh wound was excised and a Tobruk splint was applied. Midline perineal exploration was carried out and the point of the bullet was found in the urethra. The bullet was removed and the edges of the urethra approximated with one suture. The perineal incision was then brought together with a small drain in the lower angle of the wound. Suprapubic cystotomy was done. A catheter was not left in the urethra. Here the bullet traversed the upper thigh and wounded the urethra, with the point of the bullet entering the canal. The x-ray films told the whole story.

*Urinary diversion.*—Suprapubic cystotomy should be carried out in almost all cases of urethral wounds. As regards the suprapubic cystotomy itself, there is not very much that is new but what is well known is frequently neglected. The suprapubic tube should be large; small suprapubic tubes are not satisfactory. Under war conditions, where careful daily bladder lavage is not easily carried out, these small tubes become encrusted and close very quickly.

Suprapubic drainage, with a blind trocar, is carried out more frequently than it should be. This works most of the time but it is so easy to do the ordinary procedure, and in it there is no question of the position of the tube. Accidents do occur. Two such cases transferred to hospital illustrate this point. In the first case, the small suprapubic catheter was not draining and the bladder was distended. Exploration showed that the catheter tip had slipped out and was lodged in the prevesical space.

Another case was evacuated and operated on by a colleague. On arrival the catheter was not draining and the bladder was distended, with tenderness and rigidity in the lower abdomen. Exploration revealed the catheter to have moved from its position in the bladder and, in addition, the introduction of the trocar had caused two holes in the small gut which had to be sutured during the second operation. The peritoneal reflection in a distended bladder is frequently lower than it was thought to be. Entering the bladder wall under vision is safer and it takes little time.

*Wounds of the scrotum.*—The scrotum is involved in almost all genital wounds. These wounds are usually a part of more important

injuries to the testicles, the urethra and the penis. However, there are some wounds which are essentially a problem of scrotal injury. The following case is illustrative of one special problem.

An infantry officer had a missile pass between his upper thighs and, in doing so, it blew away the lower half of the scrotal skin. In addition it caused a defect in the lower pole of the left testis. The right testis was unharmed except for slight bruising. The two testicles were hanging free, with a roll of scrotum around their upper poles.

The wounded left testis was resected and the tunica albuginea closed. The scrotal tissue was excised, dissecting away all the contaminated membranes. The remaining skin was pulled over the two organs and the scrotal covering reformed. This skin was taut because of skin loss but, in a few days, the usual compensatory relaxation occurred and the two testes were in a roomy scrotum when he was ready to be evacuated.

*Multiple small wounds of the scrotum.*—The only special point in connection with multiple small wounds of the scrotum is the importance of excision and making absolutely sure there is no urethral wound. Urethral injuries can occur without blood at the meatus and without any difficulty in passing a catheter to the bladder.

A soldier had multiple wounds which included small shell wounds of the scrotum. There was no sign of urethral damage at the first surgical operation and a catheter passed with ease and there was no urethral bleeding. However, such damage did occur. He developed urinary extravasation in the perineum which had to be dealt with. Careful exploration of these scrotal wounds establishes the condition of the urethra and, if there is urethral injury, suprapubic cystotomy is the safest procedure.

*Wounds of the testes.*—The interesting point is that severe damage to both testes is very infrequent. So often one sees a badly injured organ with the opposite testis barely touched. The great mobility in the membranes and their relative lack of fixation accounts for this happy event. The whole aim of treatment is to be conservative and to close the organ. The more care that is taken, the more resected testes can be saved. There are some cases, of course, where conservative surgery is out of the question; when the cord has been cut across with severance of the vas and vessels the testicle has to be sacrificed.

A soldier had a rifle bullet wound of the scrotum and penis. The wounds were excised. A hole in the perineal urethra was sutured and a suprapubic cystotomy done. The left testes had its cord completely transfixed by the missile and the testicle was lying free, except for some loose connection with the membranes; vas and vessels were cut completely across. The other testis was intact. In this case, of course, the testicle had to be completely removed.

The best way to deal with a damaged testicle is to take it in one hand and use a fine pair of plastic scissors and simply shear off the damaged tissue until the living tissue remains. Then the testicular covering is closed with a few interrupted sutures. Usually it is wise to cut away most of the parietal tunica or, if it is clean, to turn it back as in the operation for hydrocele. Unless the organ is completely pulped, part of it should be resected and left, providing there is a blood supply. In one of our cases, with damage to both organs, one-third of the testis was left on one side and one-half of the organ on the other. The healing was satisfactory. In all scrotal and testicular wounds, a small drain was placed in the lower angle of the scrotal wound. There is usually some seepage and it seems a safe measure in war wounds that are closed in this fashion.

*Wounds of the penis.*—The penis is seldom amputated and most wounds found are tangential, or through and through. There is frequently damage to penile skin. The procedure here is the same: if a urethral injury is obvious, a suprapubic is done.

Skin loss is always important; only the dead skin should be removed. Any skin of questionable viability is better left in position and then dealt with according to events. When there is wholesale skin loss and wide scrotal wounding, but a large scrotum, the penis can be partially buried in the scrotal skin and the skin allowed to heal in this fashion and, in a later operation, it can be detached from the scrotum, leaving enough skin free to cover at least part of the penis and enough scrotal skin to reform a scrotal sac. This procedure was carried out in one case. Cases of wholesale skin loss, without scrotal injury, are problems for secondary skin grafts. The one case seen of complete penile skin loss was evacuated to the Canadian Plastic Hospital at Basingstoke and treated quite satisfactorily by skin grafts.

*Wounds of the glans.*—These injuries usually heal very well with excision and primary suture. The excision may result in some deformity but the end result seems satisfactory under the circumstances. One case had a through-and-through bullet wound of the end of the penis, involving the urethra and the glans. The urethra had a tangential hole in it. The wounds were excised and the wound of the urethra sutured. Suprapubic cystotomy

was done and primary healing took place. Another special point is where the meatus is involved in the wound. Here the urethral epithelium must be carefully sutured to the skin; however, it is most important to leave an oblique mouth in the new meatus. This ends in an appearance like a glandular hypospadias, as it did in two of our cases, but the healing was quite good and there was no chance of terminal stricture, which is all-important in these wounds of the glans involving the meatus. Another point of interest in these wounds is that frequently the foreskin is so blasted and torn that a circumcision should be done. This was carried out in three of our cases. However, it is only permissible when skin loss is not a factor in the penile wound.

Wounds of the body of the penis follow general lines of treatment; excision and arrest of bleeding; suture of the penile fascia and the urethra.

One case was of some interest. A soldier received a deep wound on the ventral surface of the penis about one inch behind the glans. Examination showed that when a catheter was passed, it came out of the wound. Suprapubic cystotomy was done and the penile wound explored. The urethra was seen to be completely severed. The wound was thoroughly excised and the ends of the urethra trimmed. There was a small gap in the approximation of the divided ends of the urethra. To close this gap, the urethral cavernous body was dissected free from the under surface of the dorsal cavernous body until the extra length was obtained. End-to-end suture was carried out in the usual manner over a 20 French catheter, and following the end-to-end suture, the catheter was removed. Before evacuation a catheter was passed along the urethra and no hitch was encountered. The patient was seen two months later in England and he voided without any difficulty and had a good stream. The wound healed by first intention without a catheter in the urethra.

Urethral wounds were all approximated and sutured, if that was possible. The only cases where an indwelling catheter was left in position were those of complete separation of the urethral ends in positions where suture could not be carried out.

A soldier had a through-and-through bullet wound of the pelvis, with fracture of the pubic rami and urethral separation at the prostatic apex. Suprapubic cystotomy was done and a urethral catheter carried into position in the urethra from the bladder, after a sound was manipulated through the complete urethral canal. Because of the complete separation and the difficulties of suture in this position, the catheter was tied in.

#### SUMMARY

The importance of primary definitive surgery in these genital wounds cannot be over-emphasized. The blood supply is so good that the time factor can usually be ignored. One of

the cases was 54 hours old; two cases were 30 hours old, and four other cases were 24 hours old when they came to surgery. The condition of the wounds did not contraindicate primary suture. These wounds reacted in the same fashion as the late and dirty wounds of the scalp which were thoroughly excised and then closed. Primary suture makes for less deformity, less scarring and less sepsis. This is only true if excision is carried out in a thorough manner and if the cases can be held under review until considered safe to evacuate.

#### CONCLUSIONS

Points of outstanding interest in wounds of the genitals are reviewed;

1. Primary suture with penicillin powder locally and penicillin systemically, was the routine in all cases.

2. Suprapubic cystotomy was done in almost all wounds involving the urethra.

3. Testicular tissue was resected whenever possible.

4. Indwelling catheters were not used except in those cases of wounds of the urethra where approximation of the divided ends was not possible.

5. Wounds of the external meatus were repaired so as to leave an oblique mouth and thus avoid terminal stricture.

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#### SOME THOUGHTS ON PUBLIC HEALTH IN NEW BRUNSWICK\*

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**P**UBLIC health and preventive medicine have reached the front line of social progress. In any scheme of medical services, preventive medicine and curative medicine cannot be separated, the two must be brought together in close co-operation.

It is possible that the purpose and objectives of public health may not be clearly understood, possibly because medical practice has focussed upon disease as it occurs in the individual patient, while the public health physician is more

concerned with the health of the communities and the broader aspects of disease, environmental protective measures, morbidity and mortality rates and the economic loss incident to disease. In the final analysis the objects are the same, better health for the people. We can say that the modern public health movement was founded upon the discovery of the last six decades in the field of bacteriology. The institution of preventive measures was made possible when the etiological agents of many of the infectious diseases and their mode of spread were discovered. Thus, a new era was brought forward in the field of preventive medicine, as well as in curative medicine.

It is to be noted that the interdependence of the public health physician and the practising physician became manifest as each new discovery in this new field became known. This was again made more evident as public health laboratories developed, particularly as they offered increasing diagnostic facilities. The practising physician would feel helpless without these diagnostic facilities, and also in the further aid given in the control and treatment of certain diseases.

We believe that the practising physician, however lofty his ideals are, has not realized the changes in his environment, which medical science and social re-orientation have brought about. He is being taken from the home of the sick to the hospital ward and his professional office; he is losing touch with the family, the home, the economic environment of his patients and as a result, various public health agencies are now concerned with the environmental factors and social implications of health.

In the future, medical practice will centre more and more in the modern hospital. There is no doubt that the extensive hospital program which is on the way in this country will distinctly influence the pattern of medical practice as well as the distribution of qualified physicians.

In our opinion, there is every reason for renewing the drive for more adequate local health services and for increased efficiency in administration, in the extension of our concepts of public health, and the corresponding expansion of functions.

The attempt to fix boundaries of public health programs by establishing a distinction between prevention and cure, must lead only to confusion

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\* Address delivered at the Annual Meeting of the New Brunswick Division, at Bathurst, N.B., in September, 1948.

and incertitude. Medical science has conferred a new and great benefit upon society in the last generation. The years of our lives have been steadily increased. This helps, not only the individual who wants to go on living and living in dignity and self respect, but all the people to live more comfortably and freer from fear.

There is no question that the need for more medical care exists, also there is no question that this need will have to be met. The problem is *how* can it be met? All over the world, the people are stirring for higher living standards. Improved medical care is the foundation of that better standard. Without good health, of what advantage are higher wages or shorter work hours, better education or greater leisure?

This striving of the people for better living is felt everywhere. The medical profession has justly earned great influence in the community, it can keep that hold only as it moves forward. It will lose that hold if it has nothing but objections to offer and will not do what is expected of them. We must look for what can be done and do it. The great question is *how*?

We know that the public is demanding better and more medical services, through some action or other.

In our department, we have gone ahead with the development of cancer diagnostic clinics. We realize that they might not be able to meet all contingencies, but at least it is a beginning and we believe one in the right direction. As we collect information and experience to better them, we propose to profit from the lessons learned and make the necessary adjustments. It is our frank opinion that our cancer diagnostic clinics will not only help and stimulate the clinicians who are manning them but will also assist the practising physician, because he will want to keep informed and carry out the examinations on his patients in a more thorough manner. This also brings up the important question of training for the general practitioners, which we believe is most necessary for the successful carrying out of such a program. The medical profession have now had one full year's experience with our cancer diagnostic service. We regret that more clinics have not been opened: in some areas we know that at present it is not possible; in others however, we believe that the only reasons that our proposals have not been completed many months ago has been due to the fact that the profession in various areas of the

Province have not been able to reconcile their views with ours, which attitude we hope will eventually be changed. In this particular field, it is our intention to have an adequate number of these diagnostic clinics placed at strategic centres in the Province. If our original plans do not materialize, we will have to consider the placement of these in other areas. It is our opinion that our plan is a democratic one and we believe that the people of this Province are entitled to some assistance from the Department of Health, so as to get adequate facilities whereby early diagnosis can be carried out.

For many years, I did tuberculosis diagnostic work in the Province and I am confident that the work of this service served a two-fold purpose: (1) in helping to ferret out tuberculosis; (2) in making the medical profession more alert in diagnosing their cases. We are perfectly aware of the fact that some practising physicians in the Province seem resentful that the Department of Health have taken over the sanatorium care of tuberculosis patients, and to a fairly large extent the diagnostic field of that disease. I suggest to you that it was a very necessary step, and it is our aim and object through your co-operative efforts to eventually control this disease, which can be done.

Let us turn to the field of mental hygiene. Up to the present, there has been no program established. It is our opinion that we need mental hygiene clinics at the preventive level, to assist the general practitioners and also the specialist. In order to establish these clinics, specially trained personnel are needed and financial assistance. We believe that these two factors have been the barriers to their development. It is anticipated that a trained co-ordinator of this program will be appointed as soon as he can be located. We believe that to carry on the work of different types of clinics, the closest co-operation between our department and the practising profession will be as necessary as has been proved in the cancer field. It is our intention not to break up the doctor-patient relationship but rather to encourage it, as we look upon such clinics as being of assistance in better diagnosis and the giving of better care to the patient.

The laboratory situation needs revision and revamping. We are fully aware of this, as up to the present, we have only the Provincial laboratory at Saint John. This laboratory is doing excellent work, but the accommodation

and staff are too inadequate for the provision of really high grade laboratory service. It is our belief that the centralization of one laboratory at one point does not give the best type of service to the medical profession. It is our goal that the Province shall be divided into four regions and that laboratory facilities shall be made more easily available to the medical profession. This particular decision has been the result of some years of consideration and many months of special thought and planning.

Up to the present, the field of dental hygiene has not been explored and I know that you are well aware that many areas in our Province are inadequately looked after. This is understandable due to the small number of practising dentists that we have in our Province. However, it is our opinion that this matter which has given us much concern for some little time, will be given further thought and study to see how we can round off a program which will do effective preventive work. With this in view, Dr. R. S. Langstroth will henceforth direct this program for this department.

If I were asked for the definition of a department of health, I would say that it is intended to serve the people and to assist the medical profession. This function will be realized only in the proportion to which the medical profession take a real interest. We believe that the medical profession has not, in the past, concerned themselves enough with immediate and long term planning. We need your assistance, your advice. I will also admit that in the past your advice was perhaps not asked for. However, in the last year our department has made every reasonable effort to keep at least the executive of the N.B. Medical Society as much in the picture as possible, with regard to our thinking and planning. I must say that we are most grateful for the very serious discussions which certain members of the medical profession who are present here today, have had with me and members of my department. We have in our opinion, further carried out our planning on most democratic lines. The most recent example of this is the request of a special meeting of your executive to obtain their recommendations as to how we can best take advantage of the new Federal money in the field of cancer.

As you are all aware, the national health program now opens a new era for health. It is the first step towards attaining the ideal in health

insurance, which is being carefully planned by stages by the Federal Government. The program includes the following grants under 3 main headings: (1) The Health Survey grant. (2) Hospital Construction grant. (3) The National Health grants.

Since 1942, it has been the avowed intention of the Federal Government to implement a comprehensive national health insurance scheme. The planning has been going on very extensively, and in the last year planning was placed under the Department of National Health and Welfare at Ottawa. Only at the beginning of August was Dr. F. W. Jackson, formerly Deputy Minister of Health for Manitoba, appointed as Director of Health Insurance Studies. I must say that planning has been carried out with the active co-operation of the C.M.A., Canadian Hospital Council, Canadian Association of Registered Nurses, Canadian Welfare Council and many other interested groups. As a result of this planning to date, the Federal Government in May of this year, announced the new and large health grants to Provinces. When the announcement was made, it was made for the expressed purpose that these would take care of urgent matters, in preparation for the completion of a comprehensive health insurance scheme. It is apparent that the Federal Government proposes to leave the planning and the administration of the new health grants as a distinct Provincial responsibility, while they in turn will keep only a "benevolent watching eye" on the proceedings. The exact wording of the announcement would lead us to believe that this would be implemented before the end of the five years' program, which is covered by the present health grants, and to the best of my knowledge and belief this program will then become effective.

The overall picture of the grants as it concerns New Brunswick is as follows: \$1,214,662, which can be broken down as follows:

Non-recurring and non-matching grant—health survey .....	\$ 27,454.00
Recurring and non-matching grants: general public health; tuberculosis control; mental health; crippled children; professional training .....	\$531,329.00
Recurring and matching grants: hospital construction; V.D. control; cancer control .....	\$655,879.00

A few words as to how this money may be used. Let us take the health survey grant (there will be a flat grant of \$5,000 to each Province,



the balance to be divided between the Provinces on the basis of population). This undoubtedly comes first, because it is imperative that we must know and study the health needs of our Province, if this money is to be used advantageously as the precursor of health insurance. Definitely this forms the key part of the program, as it is upon the findings of this study that the expenditures will be based. Great attention must be focused on this survey.

This grant will also enable the Province to establish planning machinery that will be necessary before it can adequately survey its existing needs, lay plans for the expenditure, study extension of the hospital accommodation and prepare the proper organization for hospital and medical care insurance.

*Hospital construction grant.*—It is naturally to be understood that before health insurance can be established on an adequate basis, another development is essential. There is in our Province a tremendous shortage of hospital beds and for additional inducement to hospital construction, grants of \$1,000 per bed for active treatment beds and \$1,500 per bed for chronic or convalescent beds are to be allowed. This of course has to be matched by the Province.

As to the National Health Grants, they broadly cover the entire field of public health.

*The general health grant.*—Which is a grant of 35 cents per capita would be to inaugurate new projects or extension of projects already operating.

*Tuberculosis control grant.*—To intensify the drive against this disease. Of course in the Provinces where free hospitalization for tuberculosis is not effective, this can be instituted, but in New Brunswick since January 1, 1945, the free hospitalization of tuberculosis has been effective. So we must embark on other projects in this field.

*Mental hygiene.*—This amount starts at \$172,597 and over a period of years will be almost doubled. This grant is to assist in the planning of preventive action in this field. The training of personnel, psychiatrists, psychologists, social workers, etc., comes within the scope of this grant.

*V.D. grant.*—This is to help intensify our present efforts.

*Crippled children grant.*—This is to assist in the development of a rehabilitation and train-

ing program for crippled children. The definition of a crippled child would be: a person not over 18 years of age who, because of disease, accident or inherited defect, is restricted in his normal movements.

*Professional training grant.*—To assist in making available the public health personnel which will be required in the development of an enlarged public health program in all fields. This would apply also to developing the training of personnel required for the operation of continually expanding hospital services.

*Cancer control grant.*—Assist in development and provision of really adequate diagnostic and treatment services for the control of cancer.

All these grants are in preparation for the next step, which is national health insurance.

We know that the Federal Government is also studying certain phases of socialized medicine and has been doing so for some years. This social medical program up to date, has been limited to certain selected groups in a community, such as sick mariners, Indians, veterans and to the general population in such matters as venereal disease control. It is a well known fact that the Department of Veterans' Affairs commitments for medical and hospital services of veterans are rapidly diminishing, yet plans are going forward to enlarge D.V.A. hospitals. Where are the patients for the enlarged Federal Hospitals going to come from? Furthermore, in this regard, we have been reliably informed that considerable thought has been given to the provision of hospital and medical services to dependents of the armed services and to members of the civil service. These past years of experience in socialized medicine have enabled the Federal Government to gather many salient points and necessary information, particularly as to costs.

I personally believe that modern and democratic medical and hospital care can be given to the people of our Province; if the practising profession of New Brunswick face squarely up to the issues at stake. It can not be given if the attitude of the majority of our profession continues to be one of *laissez faire*, or of active opposition to every new proposal that is made. Due to faults on both sides in the past we believe there has been a very definite barrier between the Department of Health physicians and the larger group of physicians

engaged in the profession in the Province. If this is so, we will continue to take all reasonable steps to batter down this barrier in the future. Naturally a long term planning program for public health is of extreme importance and will require the full time employment of a co-ordinator. As a result, a new position will follow. Off the record, I can tell you that we have been fortunate in being able to find in our own Province, a man whom we think will be very capable of carrying out the functions of the position concerned. This man has been a general practitioner at one time. He has had considerable experience in the administrative field, both in the Army and as a member of the Department of Health. I have much pleasure in announcing that Dr. A. M. Clarke will be appointed as Director of Health Planning Services.

In concluding my remarks, I do wish to bring to your attention and consideration, the fact that the time is now here when the public realize and want to get the best medical and hospital care which can be given in our Province. However, you must remember that New Brunswick is primarily an agricultural Province and the necessary adjustments must be made to give the rural areas the medical services that they need.

We must not adopt an attitude of *laissez faire* as has been done in the past. Somehow or other, the medical profession seems reluctant to pioneer social policies. We must not let things work themselves out. We must take an active interest and participate in the developments if we wish to have a voice in the future of medical practice. We must remember that the medical profession serves the people individually through scientific service, and should do so collectively through recommendations to governments. The public are determined that they will have at all social levels the best that can be offered by modern medical treatment. Governments at all levels should or do express the wish of the majority and modern medical care will be provided by one method or another.

Your thinking and your actions in the next few months will probably determine the future of medical practice in your Province. Lastly, I again emphasize to you that your main interest and ours should be that the medical profession take the lead in planning and providing better health for the people of our Province.

## THE VESICAL NECK SYNDROME IN WOMEN OF MIDDLE AGE\*

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EVERY practitioner has had to deal with women who complain of "bladder trouble". These patients are often middle-aged or elderly married women who have had one or more pregnancies. The attack usually comes on suddenly, frequently after chilling, exposure to draught, or sudden change of temperature, a fact often not remembered by her unless closely questioned about it. There is marked frequency of urination, both day and night, passing small amounts of urine with considerable pain and a great deal of distress at the end of the act, leaving her with a marked sensation of not having emptied the bladder. This amounts to urgency, tenesmus and strangury, even incontinence in the severe acute cases. Also, there is not infrequently terminal blood. This is the vesical neck syndrome in women, which has its counterpart in the acute prostatitis or prostatic irritation in the male. The train of symptoms is exactly the same but the anatomy is different.

The following investigation comprises 225 women showing the syndrome, admitted to the Department of Urology, Royal Victoria Hospital, over a ten-year period, during which there were 1,268 female admissions to the department, an admission incidence of 17.6%. This means that approximately one-fifth of all females admitted to an active urological service had the symptoms and showed changes in the vesical outlet.

The symptom-complex appeared in the lives of the great majority of the patients (63%) after 40 years of age, the preclimacteric, climacteric and postclimacteric age-periods. However, in a significant number, nearly one-fifth (19.1%), it occurred during the age-period of active and perhaps repeated child-bearing, that of 30 to 40. Only 8, or 5% occurred in early life, between 10 and 20. These latter showed mainly acute infective conditions. The marital

\* Read at the Seventy-ninth Annual Meeting of the Canadian Medical Association, Section of Urology, Toronto, June 23, 1948.

From the Department of Urology, Royal Victoria Hospital, Montreal.

status revealed that 84.5% had experienced the married state and that 15.5% were single; 62.7% had gone through one or more pregnancies.

Routine urological investigation was done on all cases and an associated upper tract condition was found in 57, or 25.3%. These lesions in the main had no relation to the lower tract lesion found in each case. They were mainly nephropotosis, hydronephrosis and in a few instances pyelonephritis.

*The symptoms.*—The symptom-complex described in the opening paragraph is the story of most of these patients. A reference to Table I shows the principal symptoms in order of frequency to be frequency of urination (98.6%), painful urination (50.9%); urgency of urination (27.5%); terminal distress or tenesmus (24.0%). Chills and fever were of infrequent occurrence. Now, these symptoms are those commonly attributed to an involvement of the bladder, a "cystitis", but the bladder mucosa and wall were found to be the seat of lesions in only 13.8%. The inference we draw is that the syndrome is due to lesions of the vesical outlet rather than the bladder itself.

TABLE I.  
SYMPTOMS

Frequency of urination (D or D and N)	221 or	98.6%
Painful urination	115 or	50.9%
Urgency	62 or	27.5%
Terminal distress (tenesmus)	54 or	24.0%
Terminal blood	49 or	21.7%
Stress incontinence	23 or	10.2%
Chills and fever	11 or less	1.0%
DURATION OF SYMPTOMS		
1 day to 18 months	138 or	61.4%
1 year to 10 or more years	87 or	38.6%
PREVIOUS ATTACKS		
	60 or	26.7%

The duration of symptoms was of interest and in fact somewhat surprising. Over 60% complained of symptoms from one day to 18 months, while 40% said they had symptoms from two to seven years or more, in one instance for 40 years. This indicates that in an appreciable number the symptoms are not obtrusive and that it is only when they become violent and insistent that some patients seek medical assistance. However, we feel that in this class the stage is already set for trouble, the jig-saw puzzle is complete except for one piece and that missing piece to our mind is chilling exposure to cold and draught, or sudden change of temperature. This is a most

important inciting factor, one that sets the train of symptoms in violent motion.

*The urine.*—The urine in this series was of interest only in regard to the microscopical content. Pyuria, varying from a rare pus cell to frank pus was found in 173 cases or 76.8%, but in 40 cases (17.8%) neither pus nor blood cells were found. In other words, almost 1/5 of the series were free of evidence of infection or irritation.

In order to study the lesions found at examination and cystoscopic visualization, the anatomical structures were considered as follows: *A.* the pelvic outlet; *B.* the anterior urethra; *C.* the vesical outlet consisting of the trigone, the vesical neck and the posterior urethra; *D.* the bladder mucosa and wall.

#### THE LESIONS FOUND

In the 225 females under study in this series 458 lesions involving the structures enumerated above were found. Tables II, III and IV give the details. Lesions or deviations from

TABLE II.  
A. LESIONS OF PELVIC OUTLET

Lesion	Number	%
Cystocele.	37	60 or 13.1
Rectocele.	23	

#### B. LESIONS OF ANTERIOR URETHRA

Contracted urethra.	118	170 or 37.3
Small meatus	13	
Caruncle	35	
Granular urethra.	3	
Cyst of urethra.	1	

TABLE III.  
LESIONS OF VESICAL OUTLET = 164 = 35.8%  
LESIONS OF TRIGONE

Lesion	Number	%
Congestion..	29	= 113 = 24.6
Granular	23	
Pseudo membrane	22	
Inflammation	17	
Cysts and follicles	12	
Edema	8	
Varices	2	

#### LESIONS OF VESICAL NECK

Lesion	Number	%
Cysts	15	= 40 = 8.8
Hyperplastic mucosal fronds	6	
Congestion.	6	
Edema...	5	
Granular	5	
Inflammation	2	
Obstruction	1	

the normal anatomy and physiology were commonly found in the following order of frequency: (1) the urethra 37.3%; (2) the vesical outlet 35.8%; (3) the bladder mucosa and wall 13.8%; (4) the pelvic outlet 13.1%.

*The urethra.*—The commonest lesion of all was found to be contracted urethra, either in the form of a general stenosis, or a small urethral meatus, or a localized constriction somewhere in the lumen. This lesion formed 28.6% of all lesions.

TABLE IV.  
LESIONS OF POSTERIOR URETHRA

Lesion	Number	%
Granular.....	5	= 11 = 2.3
Cysts.....	2	
Inflammation.....	2	
Hyperplastic mucosal fronds.....	1	
Congestion.....	1	.

LESIONS OF BLADDER MUCOSA AND WALL

Lesion	Number	%
Acute Cystitis.....	10	63 or 13.8
Subacute cystitis.....	15	
Chronic cystitis.....	31	
Trabeculation.....	5	
Ulcer bladder wall.....	2	

SUMMARY OF LESIONS

	%
(1) Urethra.....	39.3
(2) Vesical outlet.....	35.8
(3) Bladder mucosa and wall.....	13.8
(4) Pelvic outlet.....	13.1

*The trigone.*—Trigonal changes were much more common, in our experience, than the literature to date indicates. They formed 24.6% of all lesions found. These changes may be varied and diffuse, ranging from simple congestion and varices to marked changes in the mucosa. Changes due to inflammation we have found in our series in only slightly more than 1/5 of the lesions observed in the trigone. It is our contention that changes seen in this structure such as the granular, pebbled trigone, the pseudomembrane and the follicles and cysts found by us in more than 50% of the trigonal lesions are not due primarily or principally to inflammation but are an expression of the endocrine and vitamin deficiencies not uncommonly seen in the age-periods of the greater number of the subjects studied. This will be discussed later.

*The vesical neck.*—The same holds true for the observed lesions of the vesical neck, where

only 17% of frankly inflammatory lesions were seen. Cysts and hyperplastic mucosal fronds and granular conditions of the mucosa formed 61% of the lesions seen in this structure.

*The posterior urethra.*—Coming now to the posterior urethra we find the same type of lesion in even greater percentage. Granular conditions, cysts and hyperplastic fronds from 72% of the lesions found there.

*The bladder.*—Pathological changes in the bladder mucosa and bladder wall made up 13.8% of all the lesions observed by us. They consisted mainly of inflammatory reactions, cystitis either acute, subacute or chronic. The acute form occurred mostly in subjects in the age-period 10 to 20. Over half of the cases observed were of the chronic type and of these 6 proved to be interstitial cystitis. All this points up the significant fact that many cases labelled "cystitis" are in truth not really an inflammation of the bladder but are on proper investigation found to have definite lesions of the vesical outlet or the urethra.

*Cystoscopic appearance* of lesions of the trigone, vesical neck and posterior urethra. The lesions of congestion, varix, œdema and inflammation are commonly known and recognized, but too often the granular change of the mucosa, the follicles, cysts, pseudomembrane and hyperplastic mucosal fronds are not recognized or are overlooked.

*Granular change* of the mucosa of the vesical outlet was not uncommon with us. In the trigone it is seen as a fine stippling or even a pebbling of the mucosa taking the colour of the normal mucosa of this area, or at times tending to a greyish-white colour. It may be anywhere on the trigone but most often is found at the juxta-vesical neck region. Sometimes it extends to involve the vesical neck and the posterior urethra but more often these areas show separate isolated lesions.

*Pseudomembrane* of the trigone made up nearly one-fifth of the observed lesions of the trigone. This lesion appears only on the trigone and only in the female. It may be seen as a pearly-white cloud within the trigonal mucosa with its posterior and lateral borders serrated and more or less sharply delineated. Toward the vesical neck it fades into the mucosa. It very seldom covers all the trigone, but more often there are patches on either horn of the trigone or in the juxta-vesical neck region. This

trigonal condition is commonly regarded as a trigonitis which it probably is not, because where this presents as the only lesion of the vesical outlet the urine will be found uniformly free of evidence of infection.

Luis Cifuentes<sup>1</sup> has noted changes in the trigonal mucosa of many adult women. Endoscopic biopsy of the mucosa of these areas in 20 cases reported by him failed to reveal any evidence of inflammation in the submucosa and he found a flat stratified epithelium which he considers atypical epithelium of the trigone markedly resembling vaginal epithelium. He believes that many women have these patches without any bladder symptoms and that they occur in adult women of full endocrine sexual activity and that they are an expression of this activity.

In our series we observed pseudomembrane of the trigone in 22 cases. All had some symptoms of the vesical neck syndrome. In only one case was there frank evidence of urinary infection and biopsy was not performed in any case. One case was observed at the age of 17 years; 9 between the ages of 20 to 40 and 11 between the ages 40 to 60, and one at the age of 62. In our series then, more than one-half occurred in the age-period of sexual decline in contradistinction to Cifuentes' observation that the epithelial change is one occurring during full sexual activity.

*Follicles and cysts* constituted one-quarter of the observed lesions of the vesical outlet. The trigone was most often involved, the vesical neck next and the posterior urethra least frequently. On the trigone these lesions appeared as brownish-yellow heapings-up of the mucosa varying in size from that of a transverse section of the ordinary wooden match stick to slightly larger than the head of the sulphur match. They were seen singly or in groups but seldom in the profusion of the so-called "trigonitis cystica". In the vesical neck they appeared usually on the "sky-line" of endoscopic observation as isolated more or less clear elevations, most often from 4 to 7 o'clock but very infrequently around the clock.

*Hypertrophic mucosal fronds* designated "enfolds" by Powell and Powell<sup>2</sup> in a recent excellent paper, in our series formed only 6.1% of the lesions found in the vesical outlet. This to our mind is not a true picture of the real incidence of this type of lesion in patients presenting the "vesical neck syndrome" of

symptoms. The reason we make this statement is because earlier in our experience we were not sufficiently aware of such lesions and they were not looked for.

These appear as finger-like projections of normal-appearing mucosa floating into view on the "sky-line" of endoscopic visualization at the junction of the vesical neck and the posterior urethra. They may appear as single or multiple fronds anywhere around the clock but mostly from 5 to 7 o'clock. In some cases they may appear so profuse as to form a collar around the vesical neck which we have termed "internal caruncle". Actually, we believe that these really arise from the posterior urethra but because of their juxtaposition to the vesical neck they may be clinically considered a part of the latter structure.

Powell and Powell found these lesions in the posterior urethra so profuse in over 8% of their cases as to cause obstructive symptoms. In fact these authors report 10 cases in which the posterior urethral "enfolds" were so profuse as to merit the term "female prostate".

#### DISCUSSION OF THE PROBABLE ETIOLOGICAL FACTORS

The etiological factors concerned here may be taken under the following headings: (1) trauma; (2) infection; (3) vitamin deficiency; (4) endocrine imbalance.

That the trauma of cohabitation and more particularly that of child-bearing plays an important rôle in at least laying the ground-work for the changes seen in the vesical outlet and urethra of women appears reasonable. Approximately 85% of the subjects under review had experienced the marriage state and over 60% had had one or more pregnancies.

When one considers the anatomy of the parts: the shortness of the urethra and the proximity of the vesical outlet to the external surface and the further fact that the parts are constantly in the presence of infective agents, even though this may be of low grade virulence or of non-specific pathogenicity one can readily visualize the part that infection must play in causing the changes noted. While the majority of our series (76.8%) showed some clinical evidence of infection yet nearly 1/5 (17.8%) failed to show it. We feel that too much emphasis is put on infection as a sole etiological factor, that there are other factors

operating and that the changes come about due to not one but several factors. These other factors may very likely be vitamin deficiency and endocrine imbalance coming about at the preclimacteric, climacteric and post-climacteric age-periods of the majority of the subjects.

With this in mind we made vitamin assays of the blood concurrently with androgen and oestrogen assays of the urine in a series of these patients. The number of cases (10) investigated is admittedly too small to allow of any definite conclusions but even this small series indicates that there are significant changes which will bear further investigation. All showed definite, in some cases marked deficiency in vitamins A and C. Experimentally deprivation of vitamin A causes changes in the epithelium of the vesical outlet. May not prolonged deficiency along with the other factors noted produce change?

The other finding was a lowering or deficiency of the oestrin content of the urine while the androgenic substances remained at the normal level, thus producing a predominance of the male hormone—an imbalance.

Numerous investigators<sup>3,4</sup> have proved the existence of glandular structures in the posterior urethra and vesical neck of females which are considered to be homologous accessory glands of the prostate gland. It is also known<sup>5</sup> that the gonadal secretion stimulates the homologous accessory structures of the reproductive tract. It appears then a reasonable deduction that the predominant male sexual hormone present in these women very probably does have a stimulating effect on the homologous structures present in the vesical outlet of the adult female.<sup>6</sup> The clinical picture and the lesions observed at cystoscopic and endoscopic examination would tend to corroborate this conclusion. However, we wish to emphasize again that there is not one but several etiological factors at work. And here lies the field for further investigation.

#### TREATMENT

(1) *The acute case* with pyuria. Here only symptomatic and palliative treatment should be carried out until the acuteness has subsided.

One teaspoonful of citrocarbonate in a full glass of water every hour ensures the alkalinization of the urine and promotes diuresis. It lessens or causes the disappearance of the acute dysuria, the terminal pain, the terminal blood,

the urgency, tenesmus and strangury. At the same time the administration of urinary antiseptics may be begun. Coliform organisms are the most frequent invaders, therefore sulfonamides in the form of trisulpha, 15 grains three times daily often cut short the acute infection. Sometimes it is advisable to enhance the bactericidal action of the sulfonamides with methylene blue, gr. one three times daily. According to McLean<sup>7</sup> and others this drug has a synergistic action.

If this form of therapy does not cause a recession of the symptoms or improvement in the pyuria in from 5 to 7 days other urinary antiseptics must be tried. Among these are mandelic acid preparations, of which the calcium mandelate is the best tolerated. Two teaspoonfuls well stirred in cold milk every four hours appears to be effective.

Another form of therapy particularly useful for prolonged administration consists of tablets of uromand or prohydriol containing approximately 5 grains each of calcium mandelate, urotropin and ammonium or sodium acid phosphate in combination. Four tablets three times daily are prescribed. Pyridium 0.1 gm. three times daily is used, at times, chiefly for its analgesic effect on the mucosa of the tract.

(2) *The acute case* with clear urine and no pyuria. This type is often entirely missed for long periods, being considered a neurotic. Citrocarbonate or pyridium should be tried during the acute stage.

In all cases thorough urological study is imperative to determine the seat and the kind of lesion present.

*Treatment of the specific lesion.*—(1) Constriction, stenosis or stricture of the urethra is the commonest lesion found. Dilatation of this structure is the most important single therapeutic procedure in the conditions under discussion and it is always indicated. The dilatation coincident with cystoscopic or endoscopic examination is ordinarily not sufficient, therefore it must be carried out by the gentle passage of sounds up to the calibre of at least French 28, not infrequently to French 30 to 32. The olive-tipped bougie is an excellent instrument for the detection and localization of localized urethral narrowings. Because the urethra is a resilient tube it will be found necessary to repeat the procedure periodically; at first every 2 or 3 weeks for several times, then at the first sign

of recurrence of the symptoms. Recurrence is not uncommon.

2. *Complication of the urethra* is a lesion of the anterior portion of the deep. It may be dealt with by the same method of electro-coagulation. If the electrode is used the coagulation must be done gently, lightly and not too deep. It always shows a prolapse of the urethral tissue resulting in a urethrocele. A urethrocele is an expression of a dilatation of the urethra therefore dilatation of the urethra must always be carried out as soon as the cystitis generally appear to be cured of this fact.

3. *Complications*, follicles and cysts of the urethra are best treated by dilatation of the urethra and the vesical neck using the dilator sounds or a straight Kollmer dilator and radial electro-coagulation. For this procedure a point electrode at low intensity is used. If there are tri-angles as the stroke begins in the juxtaposition is carried anteriorly over the vesical neck and ends just within the posterior urethra. It must not be extensive or deep as it must be taken not to injure the external sphincter. The coagulation strokes should not be too close together, say 4, 6 and 8 o'clock. The postoperative edema of the urethra must be too intense. Much benefit is obtained from a few well placed coagulation strokes as the tissues between tend to resorb their normal condition. This has been verified by re-examination.

4. *Hypertrophic mucosal fronds or "enfolds"* are treated as the above. However, if these are to be extensive and obstructive they may have to be resected.

5. *Contracted vesical neck* is not common but in mild cases dilatation may suffice, in severe cases resection is indicated.

6. *Uterine tract lesions*, commonly in the cervix of the uterus must not be forgotten. They must be ruled out as an etiological factor and if present treated.

*Vitamin and endocrine therapy.*—The field here is wide open for investigation. It is suggested that with vitamin A and also with oestrogenic substances that intensive dosage be given to obtain a concentration in the blood and then to drop the dosage to a maintenance level.

## SUMMARY

A series of 225 females showing the so-called "vesical neck syndrome", of frequency of urination, urgency, painful voiding, terminal distress, terminal blood and tenesmus is presented. An analysis of the lesions found in the vesical outlet and urethra, with a description of the cystoscopic appearance of the lesions, together with a discussion of the probable etiological factors concerned and an outline of a more or less specific plan of treatment is made. Finally, a line of investigation and research is suggested.

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## DEPRESSIVE REACTIONS: THEIR IMPORTANCE IN CLINICAL MEDICINE\*

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I WISH to make two points in presenting this paper. The first is the fact that many depressive reactions of mild or moderate severity present themselves primarily with physical complaints. It is the established practice in our culture for patients to go to doctors with physical complaints. On the other hand it is definitely looked down on by both patient and physician if the patient comes because of some disturbance in his feelings or in his mental life. Any doctor will listen to a patient who is losing weight, who sleeps poorly, who has indigestion, and is fatigued, but a large group of our professional brethren are horrified if they are consulted because a patient is unhappy or depressed. This general cultural attitude plus the widespread physical derangement that takes place in a depressive reaction, very commonly makes the patient with a depression consult his physician for some physical manifestation. The physician very commonly tends to fixate the physical complaint by over attention and over examination, and never thinks to inquire into the mood of his patient until some tragedy such as a suicidal

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attempt has been made, and then too late attention is focussed on the mood disorder. I feel therefore that a knowledge of the commonness of the depressive reaction and some understanding of its presenting symptoms, is extremely important for the clinician in any branch of medicine.

My second point is of special importance to those of us who are engaged in the teaching of psychiatry. To a considerable extent it seems to me that we are over-selling the psychoneurosis, and neglecting to give students an adequate grounding in the diagnosis of psychotic reactions. It has become commonplace in medical literature for sweeping statements to be made regarding the importance of the neurosis in general practice. There is little mention that such a thing as psychosis exists in a doctor's practice as well. It seems to me (and I must point out that I am using Nova Scotia as a basis for this statement), that we have done well in selling practitioners the necessity for considering psychiatric entities when faced by a patient. I feel however, that we have over-stressed the neurosis, and consequently many early psychotic reactions that would benefit from early therapy are diagnosed as a neurosis and the physician attempts to treat this by psychotherapy. Usually the end result of this is that the patient does not improve or gets worse and the physician is fed up with psychotherapy. I find this state of affairs in my medical students and in my professional colleagues, and feel that it is time that one should stress the fact that many patients who consult physicians are psychotic and that everyone that has complaints on an emotional basis is not an example of a neurotic reaction. For these reasons then I wish to call attention to the importance of depressive reactions, some of my experiences in private practice with depressive reactions and my thoughts regarding the diagnosis and treatment of these reactions especially as one sees them in private practice.

The symptomatology of the depressive reaction is well known. Briefly it may be stated that depressions are psychobiological reactions, characterized primarily by low mood with a gloomy thought content usually containing ideas of self-blame, worthlessness, of a hopeless future, and very commonly suicidal preoccupations. In addition to these psychological phenomena there are important physiological changes. One of the outstanding is a change in the general motor activity of the body, a person being either

slowed up and retarded in all his activities or restless and agitated. From the teaching angle it seems to me that most depressions can be so characterized. One finds other typical features; there is nearly always a sleep disturbance in which the individual falls asleep very quickly but wakes very early in the morning; diurnal variation, the patient feeling much worse in the morning and better at night; nearly always loss of weight (sometimes in alarming quantities); and disturbances of sexual functioning, amenorrhœa in the female and impotence in the male. Disorders of organ-functioning in any area of the body are common. Perhaps gastro-intestinal functioning is most commonly disturbed.

In agitated depressions most of the above symptoms hold with agitation replacing retardation and often bizarre complaints, body delusions, delusions of guilt, etc.

In the retarded depressions the periods of illness are apt to occur in recurrent bouts, sometimes interspaced with bouts of elation and excitement the so-called manic attack, but it is noteworthy that in Rennie's carefully studied series of cases, only 10% had evidence of both manic and depressed attacks. These recurrent attacks come on at various periods throughout the patient's life, and most authors explain that they are associated with personal stress and tension, which precipitate the attacks. In my own cases over the past seven years, I am nearly always able to find such a period of stress and tension, which might be a precipitating factor. The disturbing thing to me is that in taking careful histories of these patients, I nearly always find that they have passed through many periods of stress and strain, much greater than those which have precipitated their illness. I am developing the feeling (and feel that other people in private practice will confirm this), that especially the retarded depression seems to be a biologically determined illness, which is only secondarily affected by psychogenic considerations. The agitated depression on the other hand tends to occur usually only once in a life, the possibility of spontaneous recovery is not nearly as great as in the retarded depression and the period of illness is certainly longer. The illness itself seems to be directly related with many prepsychotic personality traits, such as rigidity, an over-strict conscience which never allows the patient to have any fun in life, and poor ability in inter-personal relationship. These



attacks usually occur in later life, very frequently around the involutional period. It seems to me that they are very frequently precipitated by the psychological stress of this period and occur in a very definite type of personality make-up. The thing which disturbs me about this formulation, especially when I have to express it to medical students, is that despite these psychogenic considerations these cases respond well to convulsive therapy, frequently with little or no consideration of the psychological factors I have mentioned. This abbreviated description will serve to illustrate my concept of the depressive reaction. For our present argument, it might be summed up as follows.

A depression is a psychobiological reaction involving the total organism. As the patient himself often says, "Doctor, they say there is nothing wrong with any of my organs, but I am sick all over." and "sick all over" is literally what the patient is. The depression is not purely a psychological phenomenon but is a matter involving the total organism. While no organ may be involved directly, being "sick all over" frequently leads to complaints regarding an individual organ, which may result from the general psychomotor change or which in some cases may symbolically express important content matter regarding the patient's illness. Be that as it may the patient frequently gets bound up in complaints regarding some particular organ, and unfortunately his doctor is likely to do exactly the same thing.

I would like briefly to illustrate the point I am trying to make, namely that depressive reactions frequently present themselves with physical complaints and the true disorder is not recognized by the physician.

#### CASE 1

J.H., a man of 31 years of age was admitted to the Victoria General Hospital in January 1940 by his family physician because he had made a suicidal attempt to shoot himself. The bullet tore through the outer margin of his left orbit, completely destroying his eye and carrying away a large area of the facial structure on the left side. He had received surgical treatment at this time, and on admission while there was extensive scarring his wounds had practically healed.

The story as he told it was that he had been feeling badly some eight months before his suicidal attempt. His method of expressing the way he felt badly was very interesting. It consisted of placing his hands on his epigastrium and saying, "I feel badly here". He had gone to his family physician the week before the suicidal attempt and had told him his story only to be reassured that it was a minor indigestion and that if he would take antacid powders and go into the woods hunt-

ing, everything would be well. This advice was followed with the results noted above. When an attempt was made to elaborate what he meant by this epigastric sensation, he revealed that it was not pain, but a depressed full feeling, and when he was invited to discuss this further he said that he "just felt bad all over". He felt bad and that life wasn't worth living any more. He had lost weight over the past four or five months, his sleep was typical, getting to sleep fairly well, and waking about 4 o'clock and not being able to sleep again. He lay in bed quietly with no spontaneous activity at all, stated that he was sorry that he had come to hospital, because he felt that he could not be helped and that it was too bad that he had not been allowed to die as he wished to do. He had had two previous depressions before, one lasting about three months and one lasting six months but both clearing up spontaneously.

In his family history there was a cousin and an aunt who had had depressions and both of whom had suicided.

He was started immediately on electro convulsive therapy, and following his third treatment showed considerable improvement. At this time he began to talk concerning his plans for the future, and would be found reading the newspaper and books; his sleep improved, he began eating well, and in the course of the first two weeks of admission had gained 10 lb. in weight. He had two further treatments and at the end of that time seemed to be completely back to his old self. He was discharged a week following his last treatment.

He was not heard from again until November, 1947, when his sister called on the phone to make an appointment for him. When asked what the difficulty was she said "Doctor it's just a little indigestion; he wants you to give him something for his stomach". I was not very alert that day, and replied that perhaps she had best see the family physician and get something for the stomach from him, whereupon the sister said, "No, it is just like he had before, won't you please see him?" The man was seen the following afternoon, and once again his complaints were identical with his previous depression. He was terrified that he would make another suicidal attempt as he had before, and begged to be admitted to hospital for further convulsive therapy. This treatment was carried out with the same improvement at the end of five treatments as he had previously had. An interesting thing that happened this time which I have not seen in other cases was the initiation of a severe bout of hiccups a few hours after his final treatment, which lasted for about 24 hours, and made him most uncomfortable during that time.

This case illustrates a typical, recurrent depression of the retarded or manic depressive type. Despite the fact that the patient presented a typical picture of manic depressive psychosis he and his family characteristically expressed his complaints in terms of a physical disorder. This was so well done that his family physician mistook the illness for a functional gastrointestinal complaint; and it was not until a serious suicidal attempt that its depressive nature was recognized. He has responded well to convulsive therapy.

#### CASE 2

Mrs. W.F., aged 52, was seen on the surgical ward of the Victoria General Hospital in March, 1946. Consultation was requested because this woman had appeared depressed, seemed very agitated at times, wringing her hands and crying, was requiring considerable

sedation for sleep, and at times expressed the wish that she would die. These symptoms had come on within a few days of having a bilateral hernia repaired. She had seemed rather quiet, and not talkative before operation but there had been no other evidence of her present condition.

The history as obtained from herself and her husband revealed the following facts. The hernia which had been present for some 20 years, were small and had caused the patient no complaint until about a year previous to operation. During that year she had noticed increasing fatigue; she had dropped out of many social activities that she had previously taken part in; her sleep was poor, having difficulty in both getting to sleep and waking early; and she had lost some 18 lb. over the course of the year. She had suffered from vague digestive symptoms which she expressed as "having gas in her stomach and being constipated". She had taken a good deal of medicine for both of these complaints without any benefit. Finally after repeated visits to her physician he had suggested that the hernia might be causing all her complaints and that it should be repaired. She had eagerly seized on this idea and for days had made her physician and her husband miserable while she had to wait to get into hospital. She was operated on the second day following her admission to hospital, her hernia were satisfactorily repaired, but her mental state deteriorated.

Her psychiatric examination at this time showed a state of considerable depression and agitation, the sleep disturbance already mentioned, an attitude of extreme self reproach with marked feelings of guilt regarding a sexual indiscretion as a young girl, and with marked suicidal preoccupations. Her past history showed no neurotic traits, she had a grade 10 education, had worked for several years previous to her marriage and had performed very well in her job. She had done housework, and her employers respected her because of the marked conscientiousness which she showed during that time. She had been engaged for about one year prior to marriage, and had had intercourse for some 6 months before the marriage had occurred. This latter fact was the subject of much of her feeling of guilt. During her married life she had been a typically good wife and mother. She had had four children, all of whom had left home with the exception of a daughter 22. She was known in the Scotch Presbyterian community from which she came as "a good woman", one who was active in church affairs, and who kept her home extremely well. She had no interest outside of her home and her church. Her views regarding behaviour in general were of a strict inhibited type. The saying that "the devil finds work for idle hands", was one which she very commonly used.

One thought that this was an example of an agitated or involuntal depression, the depression coming on in a particular type of personality and being precipitated by the family breakup which was occurring during this involuntal period. Her hernia which had been present for twenty years seemed to be the rather innocent physical factor which both patient and doctor blamed for her disturbance. She too received convulsive therapy, making a good recovery following 7 treatments, and the follow up shows that she has maintained this improvement.

#### COMMENT

This history illustrates a very common problem presenting itself to the psychiatrist working in a general hospital where the patient receives surgical treatment for complaints which are part of the depressive reaction, and the psychiatrist is called after surgery has failed.

To sum this up then it would appear that depressive reactions are very common and they frequently present themselves to the general physician with complaints which direct his attention to physical causes. Unless he is alert it is likely that he will attempt treatment through physical means, with the probability that the patient will not improve and with the possibility that suicide may occur or that useless surgery may be carried out.

The following points seem to me to be of value in suggesting the possibility of the depressive reaction and should be more or less routinely inquired into in the patient's examination. First, the presence of a history of recurrent bouts of illness. If the person during the course of his life has had one to two sharply defined attacks lasting a few weeks to months or years, and during that time has complaints of practically any sort which then get well spontaneously, with an interval of good health, followed by a second or third illness which suggests a depression, this diagnosis is likely to hold. It is rare to see these clear cut attacks with periods of good health in between in a neurotic case. Secondly, sleep disturbance, characterized especially in retarded depression by early morning waking. Thirdly, diurnal variation, if a patient with any complaints says that he is much worse in the morning and improves at night, his physician should be on the alert for a depressive reaction. Fourthly, physical complaints such as fatigue, gastro-intestinal symptoms, impaired sexual functioning are common substitutes for mood statements. Fifthly, the presence of evidence of a low mood, with the thought content of a depressive nature, may be expressed in terms of loneliness, self reproach, feelings of guilt, hopelessness about the future, etc., are all suggestive of the depressive reaction.

In conclusion, I would like to say a few words about the treatment of this type of reaction. It appears to me that with modern facilities nearly all depressions can be treated outside of the mental hospital, either as an in-patient in a general hospital or as an ambulatory patient with out-patient therapy. I feel that convulsive therapy is the treatment of choice in the depressive reaction. While aware of the real and supposed dangers of convulsive therapy, I feel that

in a depression of any severity such treatment should be carried out as soon as possible. The most potent reason for this opinion is that the patient gets quick relief from a syndrome which is perhaps as distressing as any in medicine. To this is added his quick return to economic self-support, to the gratification of both himself and the family. With regard to risk, we have had a rather interesting experience in the course of the past five years. During this time it has been possible to bring together the records of 400 depressed patients, treated with convulsive therapy. In this series we have had one death. A 63 year old woman who developed a coronary thrombosis five minutes after her convulsive therapy. Opposed to this group of patients treated with convulsive therapy, we have 10 to whom we refused treatment because of physical conditions. Of this group 4 are dead, 3 of suicide and 1 of exhaustion. It therefore appears to me that in most cases the risk of convulsive therapy is very much less than the risk of refusing treatment.

Finally I would like to say that I have the feeling that convulsive therapy in properly selected cases is the best method we have for increasing psychiatric interest in the community. I would not like to leave the feeling that we are satisfied with this mode of treatment, or that we use it widely, in fact about 10% of our cases receive treatment of this kind. However, I am sure that a properly selected depression, getting well in a few weeks with convulsive therapy does more good in convincing the rest of the profession of the value of psychiatry than anything else that we have to offer.

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## AN UNUSUAL CONGENITAL DEFORMITY OF THE KIDNEY

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**BEFORE** reporting a very rare congenital anomaly of the tubular system of a kidney, a short review of the congenital and acquired defects of renal tubules will not be amiss.

The single or multiple cysts so common in chronic interstitial nephritis are due to pressure of scar tissue upon the tubules. They are prac-

tically always cortical, and cause no symptoms unless they develop into very large cysts. They are amenable to excision or puncture and destruction of the secretory cells with diathermy or a chemical cauterizing agent.

The single solitary cyst is benign and is caused by pressure on a tubule or tubules. It may be cortical or deeply seated in the parenchyma, filled with a serous fluid occasionally containing urea. Pain may be present. Haematuria is occasionally seen. Excision is often practical but often they are found so deeply embedded in the kidney that only the extra-renal cystic portion can be excised, whilst the intra-renal portion is destroyed by some cauterizing agent. At times they are so large or have distorted or destroyed so much tissue that nephrectomy is indicated. Four such cases were associated with malignant hypertension but nephrectomy did nothing more than cause a temporary fall in blood pressure.

Usually found as single cysts they may be multiple and bilateral. Often the relief of tension at operation will promote a troublesome haemorrhage from the cyst wall. The haemorrhagic cysts are usually single, grow to large size and are usually deeply embedded in the kidney. The walls are thicker and it is difficult to explain the haemorrhage. One patient had a mass filling the whole left abdomen and weighing 3,800 gm.; it elevated the left diaphragm to the 4th costal interspace and pushed the heart over to the right of the mid line. A successful nephrectomy was performed. Occasionally papillary carcinoma develops in the cyst.

Congenital polycystic disease is not uncommon and is usually only discovered when the kidneys develop to enormous size. They practically always give rise to hypertension, low renal output and intermittent haematuria; often severe pain. Pyelograms show weirdly distorted and very irregular pictures, a congenital anomaly of the tubular system probably due to failure of union and canalization of the metronephros and pronephros tubules. The cysts enlarge slowly and gradually interfere with renal function until anuria results. A fatal issue is usually encountered in the 4th or 5th decade. There is a strong familial tendency, and cysts are often found also in liver, spleen and pancreas. Surgery may be necessary to relieve pain by evacu-

ating the larger cysts. The condition is always bilateral.

A rare form of congenital anomaly is seen in newborn infants. Where the tubules and glomeruli have failed to form and no canalization has taken place between the ureteral and nephrogenic elements, babies are either stillborn or die immediately after birth.

The diagnosis of renal cysts is neither easy nor conclusive. Unless the cysts grow to large proportions or there is pressure causing caliectasis or hydronephrosis or both; or unless there is a hæmorrhage into the cyst, or a hæma-

turia intervenes, there is seldom any reason to investigate the urological tract.

Pyelograms are none too conclusive. A circular, filling defect while suggestive of cyst may easily be tumorous, and the reverse is often seen where an almost clear-cut filling defect indicating tumour turns out to be cyst on an exploratory operation.

There should be no trouble in differentiating polycystic disease, while there is no typical filling defect as a group: the abnormalities with the elongated calyces and fantastic shapes should make a diagnosis of bilateral dis-

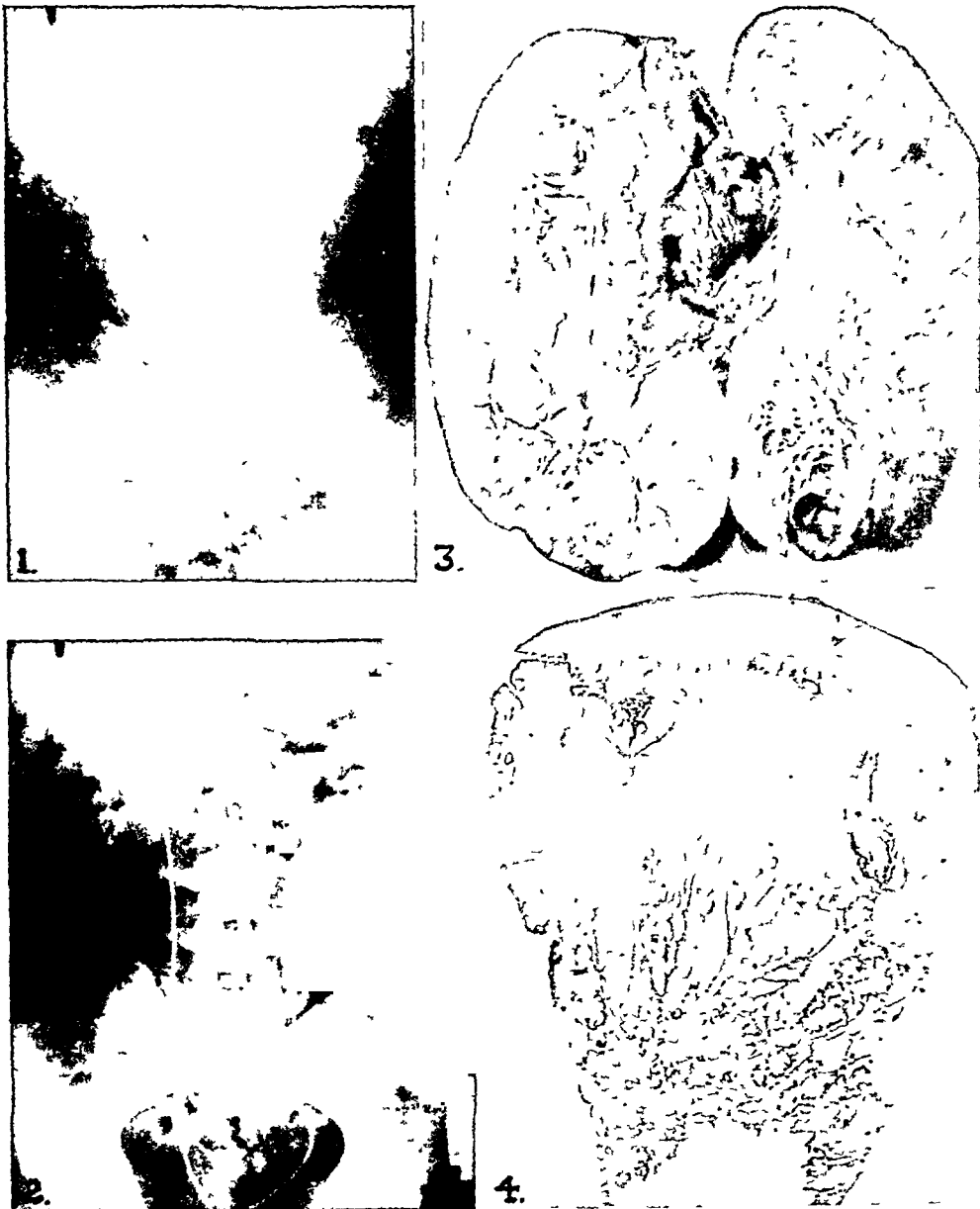


Fig. 1.—Flat plate of congenital anomaly. Fig. 2.—Retrograde pyelograms. Fig. 3.—Cross section of kidney—showing cysts and dilatation of tubules. Fig. 4.—Section of tissue from kidney showing diffuse branching and dilatation of tubules. Cyst formation.

case relatively easy. The concomitant signs and symptoms with which the condition is usually associated and the result of a complete urogram leave little doubt as to the pathology of such a congenital lesion.

#### CASE REPORT

Male, aged 20. No previous illness. He spent 2 years at sea on a destroyer in the late war. Sudden onset of pain in right renal area with fairly marked hæmaturia; no temperature.

He was a healthy looking, well-developed man. Examination of all systems except the urological was negative. The right kidney was very large, palpable and tender. Blood pressure 125/90. Renal function; creatinin 1.5, N.P.U. 16. Hæmogram normal, blood calcium normal. U.C.F. 45. Flat plate of abdomen revealed a large arborizing disseminated shadow in the region of the right kidney which appeared very large (Fig. 1).

Cystoscopy showed a normal bladder except for some redness around the right ureteral orifice. Catheters passed readily. No impairment of function of kidneys as compared with left; no albumen; phenolsulphonphthalein and urea output equal from each kidney. Microscopic examination showed a few leucocytes from right kidney; sterile cultures; hæmorrhage had automatically stopped.

Pyelograms showed a normal left kidney. The right did not show much distension. The shadows seen in the flat plate were but very little changed and there was no apparent pyelotubular back flow (Fig. 2).

No feasible explanation could be given for the abnormal findings and the symptoms referable to the right kidney, and an exploratory exposure was done.

A very large kidney weighing 500 gm. with a normal capsule and normal-looking cortex was found. A nephrectomy was done with no particular difficulty. On splitting the kidney the whole cut surface was found to be roughened by extensive minute deposits of calcium carbonate (Fig. 3). Several small cysts were present and many of the tubules were dilated and visible. Sections showed a comparatively normal cortex with normal glomeruli grossly dilated and branching tubules (Fig. 4). Many of them showed failure of canalization, others were dilated to their calyceal outlets.

A diagnosis of congenital malformation of the tubules and cyst formation of the parenchyma with multiple branching of the tubular systems was made.

The recovery was uninterrupted and the subsequent health of the patient unimpaired.

This presents a unique deformity of the kidney, the counterpart of which I have not been able to find in the literature.

I wish to thank Dr. Pritchard, Pathologist of the Montreal General Hospital for his co-operation in the study of this case, the Department of Radiology which was responsible for the radiograms, and Dr. S. A. MacDonald, my associate, who did the initial urological examination.

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## A STUDY OF CONGENITAL HEART DISEASE BY CARDIAC CATHETERIZATION\*

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THE procedure of cardiac catheterization is being adopted widely, both as an aid in the diagnosis of congenital heart disease<sup>1,2</sup> and in the study of circulatory dynamics. Although Forsman demonstrated the feasibility of catheterization of the right auricle through a peripheral vein, it was not until the publication in 1940 of the cardio-dynamic studies by Cournand and Ranges,<sup>2</sup> that the procedure was shown to be practical and safe. It is fitting that the first publication of the study and diagnosis of congenital heart disease by cardiac catheterization in Canada, should emanate from Montreal.

It was felt that this method was applicable for the diagnosis of congenital heart disease being encountered in the Heart Clinic and on the wards of Westminster Hospital. It was likewise felt that knowledge of functional capacity and prognosis of certain types of congenital heart disease could be increased, since these men had fought in a war and in the majority of instances were now gainfully employed.

Our technique of catheterization is similar to that described by Johnson and associates.<sup>1</sup> Preliminary sedation of morphine gr. ¼ and nembutal gr. 3 were administered routinely one hour before the procedure was commenced. A cut-down was made on the left median basilic vein and a Cournand catheter was introduced. Heparinized saline solution was continuously infused during the procedure of a concentration of 10,000 units (1 ampoule per litre of saline). By a three-way stop-cock this was connected with a saline manometer, the zero pressure point being taken as 4 cm. below the xiphoid with the patient in the dorsal recumbent position. This arrangement was suggested by Dr. D. W. B. Johnston and appears to approximate the method of McMichael and associates.<sup>3</sup>

The catheter was advanced under fluoroscopic control and in each instance an effort was made to catheterize the pulmonary artery. In our first four patients, a size No. 10 Cournand catheter was used. It was technically impossible to catheterize the pulmonary artery with this catheter. In all subsequent cases a No. 8 catheter was used and pulmonary artery

\* This study was carried out in the Heart Clinic and wards of the Westminster Hospital, Department of Veterans' Affairs.

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3. Director of Radiology, Westminster Hospital.

4. Director of Medicine, Westminster Hospital.

In contemplation, if a man begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties.—BACON.

catheterization was rendered relatively easy. We have not found the use of a curved tip catheter to be necessary, although it may make intra-cardiac exploration easier. Pressures have been taken from the peripheral pulmonary artery circulation; the main pulmonary artery; each chamber of the heart entered and the superior vena cava only. Blood samples have been withdrawn from these sites, placed under oil and the blood oxygen content determined by the method of Roughton and Scholander.<sup>4</sup> In two cases the results have been checked with the Van Slyke by one of us (N.J.E.) with close agreement throughout between the results. We have felt that with suitable correction of temperature and barometric readings, this method is suitable for our studies.

This series comprises 20 cases. Congenital heart disease was suspected but not verified in 9 instances. Of the remainder, septal defects were found in 5; ductus arteriosus in 2, suspected in 2 more; Eisenmenger's complex in one and in one a wandering pace-maker without other congenital abnormalities.

An unusual finding in this series is the persistence of the left superior vena cava which was encountered three times in these 20 cases. This defect, in our experience, has never occurred alone but was associated in one with trilobular heart; in 2 with ductus arteriosus. In one case a double kidney was present. It is likewise of interest that there were but two cases with congenital heart defects which showed a single defect to be present. One of these was ductus arteriosus, the other an interauricular septal defect. This bears out the well-established fact that congenital defects in the heart are usually multiple. In one very unusual instance (see Fig. 4) a right pulmonary vein was found to empty into the right auricle or into the superior vena cava. It was of interest that in this case septal defect was clinically suspected and that catheterization bore out the impression of arterialization of blood in the right chambers of the heart.

Three interauricular septal defects have been studied. In only one instance<sup>5</sup> was radiographic appearance characteristic. Another presented an associated interventricular septal defect. In the third, a ductus arteriosus was present. However, interauricular septal defect, functionally patent, may be present without producing the characteristic x-ray silhouette.<sup>6</sup>

Burwell<sup>7</sup> found the blood aspirated from a peripheral branch of the pulmonary artery to be considerably oxygen enriched. We have verified this observation repeatedly in the absence of ductus arteriosus. Although we have figures for but three examples of persistent ductus arteri-

osus, it was found that the blood aspirated from the peripheral branch of the pulmonary artery was not richer in oxygen than that aspirated from the main branch of the pulmonary artery. We submit this observation as one requiring further study, since it would suggest certain attributes in the normal pulmonary circulation. Our explanation of this phenomenon is that with respiration there is normally an ebb and flow in the pulmonary circulation. The presence of ductus arteriosus, introducing as it does the high systemic pressure into the pulmonary circulation, renders the blood flow through the lung continuous. This further suggests "central origin" for some at least, of the cyanosis seen after exercise in the presence of ductus arteriosus.

#### CASE 1

(Patent ductus arteriosus; persistent left superior vena cava.)

This male, aged 26, had led an active life without illness of any moment. The presence of a patent ductus arteriosus was diagnosed in 1941. He was permitted to do heavy duty as a stretcher bearer in combat. He developed dyspnea, dull mid-thoracic pain and was unable to carry on. He was demobilized from the Army, and was able to perform less strenuous duties. Upon returning to work as a carpenter, he noted recurrence of retrosternal, dull pain and exertional dyspnea with any form of strenuous exertion.

Examination revealed a small, well-nourished male without cyanosis or clubbing. There is congenital absence of the nail on both 5th fingers and both 5th toes. Radiologically, frontal sinuses are absent. The resting pulse was 80 with a fair exercise tolerance. Blood pressure 110/70 with no change upon exercise. The heart was normal in size. A thrill was palpable in the 2nd left interspace. A typical "machinery" murmur was heard over this area, transmitted over the precordium and toward the left shoulder and heard with grade 2 intensity at the level of the spine of the left scapula. The lung fields were clear and there was no enlargement of the liver or ankle edema.

Teleroentgenogram showed a filling in of the cardiac waist without hilar dance but with prominence of the main pulmonary vessels. The electrocardiogram showed no axis deviation or conduction disturbance. Cardiac catheterization revealed the following:

TABLE I.

	Pressure	Oscillation	Oxygen
Left pulmonary artery.	12.0 cm.	1 mm.	17.0 vols. %
Main pulmonary artery.....	11.5 cm.	1 mm.	17.0 vols. %
Right ventricle.....	9.5 cm.	3 mm.	6.9 vols. %
Right auricle.....	1.0 cm.	1 mm.	12.7 vols. %
Superior vena cava left.....	4.0 cm.	.....	15.8 vols. %

It is noted that the blood in the periphery of the left pulmonary artery has the same oxygen content as has the blood in the main pulmonary artery. This is markedly increased over the concentration in the right ventricle, suggesting that the ductus is large. It may be pointed out here, that upon this observation we postulate the theory that the presence of a patent ductus arteriosus produces pronounced acceleration in the pul-

monary circulation and loss of the normal reflux. The oxygen saturations from the left superior vena cava are of interest. In this particular case the catheter passed through the left superior vena cava only on deep inspiration. Anatomically it should be remembered that the catheter must pass through the coronary sinus when traversing the left superior vena cava to enter the right auricle. It is possible that the values called "right auricle" may represent blood obtained from the coronary sinus itself or from the right auricle immediately adjacent to the entrance of the coronary sinus. This would account for the higher oxygen concentrations obtained in the venous blood and the right auricle than that from the right ventricle.

This man's ductus arteriosus was successfully ligated by Dr. A. J. Grace. Further observations will be made to determine the alteration in pulmonary haemodynamics.



Fig. 1.—(a) Catheter tip in left posterior cardiac pulmonary artery, having entered heart through left superior vena cava—right anterior oblique position. (b) Same as (a), showing catheter in the posterior pulmonary vein. (c) Catheter in right ventricular apex with catheter looped up into right superior vena cava. (d) Same as (c) following straightening out of the loop.

CASE 2  
(Eisenmenger Complex.)

This 28 year-old male had been a Japanese prisoner of war and was examined in our Heart Clinic in October, 1946. He had not been a blue baby. His development was quite normal. There have been no significant illnesses apart from treatment for lues in 1943. He is unable to do light work at the present time because of exertional dyspnoea; left thoracic oppression and weakness in the legs.

He was a thin, poorly developed, small male with flushed cheeks, nose and ear; cyanosis of the mucous membranes and slight clubbing of the fingers. Blood pressure was 130/94; pulse 84. Transverse lie of the heart was noted with filling of the cardiac waist. A systolic click was heard in the left parasternal line in the 4th interspace with a sharp pulmonary second sound. This becomes a grade 3 rough systolic murmur with systolic thrill and a diastolic shock. After exercise a protodiastolic gallop rhythm developed at the apex. The

ocular fundi revealed full veins. The lung fields were clear, and liver not enlarged. There was no ankle oedema. The x-ray showed enlarged heart with a prominent pulmonary conus.

The electrocardiogram showed right axis deviation of high degree with S-T segment depression and a sharply negative T in Lead CR4. The urinalysis was normal; hæmatoerit 63.1 and Kahn negative.



Fig. 2.—(a) Catheter in apical portion of right ventricle, which appeared to be enlarged longitudinally. (b) Catheter tip in region of ampullary part of right ventricle, lying adjacent to interventricular septum. (c) Subsequent examination several months later, catheter tip in a right pulmonary vein, having passed through an interauricular septal defect. (d) Same as (c)—lateral position.

TABLE II.

	° Pressure	Oscillation	Oxygen
Pulmonary artery.....	.....	.....	.....
Right ventricle.....	4.5 cm.	2 mm.	16.0
	(apex)		
Left ventricle.....	55.0 cm.*	20 mm.	21.1
Right auricle.....	3.5 cm.	3 mm.	16.9
Superior vena cava.....	2.5 cm.	3 mm.	13.9
*(or at interventricular septal defect)			

CASE 3  
(Tri loculare batrium.)

This nine-year old girl, seen through the courtesy of Drs. Little, Bartram and McLachlin, exhibited well-marked cyanosis and clubbing. Patient complained of slight limitation of exercise tolerance in extremes but has been surprisingly active for one so cyanosed. It may be of significance that she is repeating Grade 3 at school.

Clinical examination revealed a heart at the upper limits of normal in size with blood pressure 110/82; a pulse of 90 and an impaired exercise tolerance. No murmurs were elicited. Auscultation revealed a double first sound at the apex. Teleo-roentgenogram revealed a globular heart with a broad superior mediastinum.

The electrocardiogram showed low voltage with a broad large P and a diphasic T in Lead CR4. Cardiac catheterization was performed under nembutal sedation. The catheter met an obstruction in the root of the neck and finally passed down a persistent left superior vena cava. Further progress of the catheter resulted in the production of a large coil in the right auricle and ejection of

the catheter into the persistent right superior vena cava. In all, the pulmonary artery, the inferior vena cava, the pulmonary vein and the ventricular cavity were catheterized. The following results were obtained:

TABLE III.

	Pressure	Oscillation	Oxygen
Pulmonary artery. ....	6.0 cm.	1 cm.	15.5
Pulmonary vein.....	3.0 cm.	..	25.8
Ventricle.....	61.0 cm.	2 cm.	20.7
Right auricle....	2.5 cm.		15.7
Superior vena cava (left).....	1.5 cm.	.....	15.4

But one question remains; that being the route traversed by the catheter in reaching the pulmonary vein, since technically the pulmonary vein was entered whilst searching for the aorta along the left cardiac silhouette. It appeared that the catheter passed in a retrograde direction through the mitral valve. The fact that the blood from the right atrium is of identical value with venous blood, further supports the opinion that the catheter could not have traversed an interauricular septal defect.

*Diagnosis.*—Cor tri-loculare batrium. It is of interest in this patient that the futility of surgery would appear established.

### DISCUSSION

It has been established that cardiac catheterization is a useful method of aiding in the localization of congenital heart defects. The procedure is not one attended by risk of complication or sequelæ. It is particularly useful where a definitive diagnosis must be reached as soon as possible. In 7 of our first 20 cases, it was possible to establish that an unusual silhouette did not represent the presence of congenital abnormality of the heart. In several others it was possible to determine the presence of more than one co-existing abnormality. This is of great practical importance, since in Case 1, the surgeon was warned that a large left superior vena cava would be encountered. This was found lying across the ductus arteriosus and associated with other venous abnormalities at the operative site. In our opinion however, it is not possible to estimate with accuracy the size of the ductus that will be encountered by pressure or blood oxygen determinations. A patient with persistent ductus arteriosus, ligated in the same week as Case 1, showed only 1.4 volumes % increase in the pulmonary artery blood oxygen, as compared with the right ventricle and an enormous increase in the pulmonary artery pressure, which measured 117 cm. of saline. In this case the ductus again was found to be of almost the same diameter as the aorta. We offer no explanation for this discrepancy.

It is worth noting that the Bohn test has been of no assistance to us in the diagnosis of patency

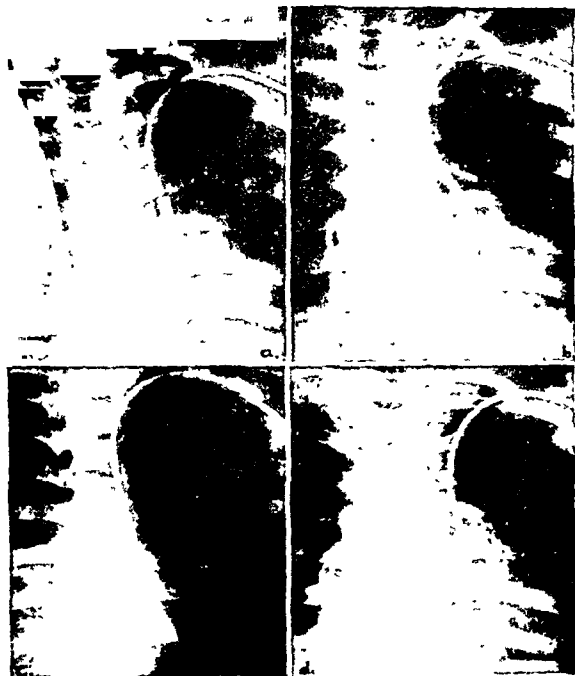


Fig. 3.—(a) The catheter enters the heart through a persistent left superior vena cava, traversing the large displaced right auricle across the mid-line and enters the right superior vena cava. (b) Catheter tip lying in the region of the left main pulmonary artery. (c) Catheter tip in left ventricular apex (slight left anterior oblique rotation). (d) Catheter tip in right main pulmonary vein to lower lobe, having passed through left ventricle, mitral valve, and main pulmonary vein.



Fig. 4.—Catheter passing directly from superior vena cava into a pulmonary or bronchial vein.



of the ductus arteriosus. We believe that the blood oxygen taken from the peripheral pulmonary artery circulation is identical with that in the main pulmonary artery in the presence of a ductus arteriosus. We further believe that this represents evidence to indicate the severity of the alteration in pulmonary circulation which results from the presence of a ductus arteriosus that is patent. We have not yet demonstrated a reversal toward the normal in this mechanism following obliteration of the ductus but this we intend to do.

Surgical selection can be based upon the information derived from cardiac catheterization. Cases 2 and 3 are examples of congenital heart lesions in whom the results of catheterization indicated that surgical procedures presently known, would not benefit these patients.

### CONCLUSION

Twenty patients in whom the presence of congenital cardiac abnormalities were suspected, were subjected to cardiac catheterization. The unusual frequency of persistence of the left superior vena cava was noted. It occurred in 3 of the first 20 patients. Where discovered, it was invariably associated with other congenital defects. The usefulness of this procedure in demonstrating unsuspected abnormalities and in selecting patients who might be benefited by surgery is clearly borne out. The blood oxygen determination by the method of Roughton and Scholander has been found satisfactory in our hands.

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History is made up of the bad actions of extraordinary men. All the most noted destroyers and deceivers of our species, all the founders of arbitrary governments and false religions, have been extraordinary men, and nine-tenths of the calamities which have befallen the human race had no other origin than the union of high intelligence with low desires.—MACAULAY.

## PELVIC ALLERGY\*

Cluny Macpherson, M.D.

*St. John's, Nfld.*

SOME eleven years ago, on January 7, 1937 to be precise—at a meeting of this Clinical Society one of the speakers for the occasion was, at the last minute unable to be present, and one of the members was good enough to pinch-hit for him by reading a paper on research work in pelvic allergy from a source which I cannot now trace.

I fear most of us have forgotten the matter, but I had cause to remember it because that night I was called out to see a young girl—only thirteen and rather small for her age—who, each time she menstruated went nearly crazy with pain. On several previous occasions I had failed to give her much relief even in adult dosage with the usual sedatives, which I have found useful in such cases.

I had found that it took a half grain of morphine and gr. 1/50 atropine hypodermically to ease her. I was worried because I felt it a serious matter to continue such treatment and, on the way to the house this particular night, I thought about the evening's paper in which it was stated that such cases of dysmenorrhœa were due to pelvic allergy; that in these cases the pelvis presented much the same condition as did the chest in asthma. No suggestions for treatment were given, but I reasoned that, if this were so, then logically dysmenorrhœa should be relieved by adrenalin as was asthma.

So, instead of giving the usual heavy dose of morphine and atropine I this time gave 1 c.c. of adrenalin chloride 1:1,000.

Only with the administration of prostigmine in a case of myasthenia gravis have I seen anything so dramatic. In ten minutes the pain was gone and did not return. In fact she did not have pain with her menses again for about 6 months when the adrenalin was again just as effective; and this time the pain did not return for nine months, rather suggesting that there was some desensitizing effect. Since that time I have used adrenalin on all my cases of very severe dysmenorrhœa with uniformly good results.

I presumed the medical world was using the same treatment until lately I have, as I pre-

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\* Read at the meeting of the St. John's Clinical Society, November 12, 1948.

sume you all have, been flooded with literature from the various drug houses on their various brands of anti-histaminic drugs.

Reading one of these brochures I noticed that it did not include dysmenorrhœa in the various diseases it was supposed to relieve. So, I looked carefully into them all and found no mention of relief of dysmenorrhœa with a single exception and that was a tablet combining phenobarbital with an anti-histaminic; dysmenorrhœa was there mentioned among some dozen other troubles the tablet was claimed to relieve and I judge such effect was attributed by the makers to the phenobarbital content.

But, I had a year or so ago carried my logical treatment a bit further by trying one of the anti-histaminic drugs (benadryl), given by mouth, on my less severe cases of dysmenorrhœa, with the same excellent results. I mentioned the matter to one of my colleagues here and he has reported to me that, in the one case on which he has had occasion to use it, he gave it by mouth and it gave the same good result I have experienced.

I feel the treatment should be more widely used and checked as I realize my limited number of patients is small on which to base conclusions.

My practice is to give adrenalin chloride (1:1,000) 1 c.c. immediately when called to a severe case.

I then prescribe an anti-histaminic, taken by mouth (benadryl 50 mgm. capsules) and suggest that, the day before the patient expects her period, she take a capsule three times a day. If somewhat less regular and not able to fix a date-definitely I suggest that she begin the capsules thrice daily the moment she knows menstruation is approaching.

Clinicians do not always follow the research workers too closely. After all, Fleming, the research worker, noticed and recorded the bactericidal properties of penicillin ten years before his discovery was followed up and given to the world. So, too, here is a piece of research which has apparently passed unnoticed by the clinicians.

I feel we have something in the foregoing that should be made known to the profession at large. It is not needing any elaborate technique or careful dosage. It can do no harm, but it certainly can relieve a great deal of pain,

and save a vast amount of working hours now lost by sufferers from dysmenorrhœa.

#### SUMMARY

1. A paper (not identified as yet) is read on January 7, 1937 from a Journal describing research pointing to dysmenorrhœa as frequently accompanied by allergic symptoms in the pelvis.

2. Adrenalin is used as a logical treatment in severe dysmenorrhœa, with surprisingly complete relief, without the depressing effects of the sedatives ordinarily used.

3. Latterly anti-histaminic drugs by mouth have been used with good results in the milder and even severe cases.

4. It is felt that such a pain-relieving, time-saving and simple treatment should be given publicity to the profession.

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#### THE STIMULATION AND INHIBITION OF GASTRIC SECRETION IN CATS BY BARBITURATE AND THIOUREA DERIVATIVES

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[IN 1942 an investigation was started to explore the possibilities of obtaining chemical compounds which might specifically affect various brain centres. Of immediate interest at that time were substances which might depress the symptoms of motion sickness and so lead to an effective form of therapy.<sup>1</sup> Using barbituric acid derivatives and closely related substances it was found that certain of these could specifically depress vomiting and yet not give rise to other undesired actions.<sup>2</sup> It was of interest to study what further effects might be produced by compounds of this type. It was decided to investigate gastric secretion since the hypersecretion usually associated with peptic ulcer would appear to be related to a central mechanism and aggravated by various mental conditions. Any drug therefore which would by a central action depress gastric secretion would theoretically at least be of value in peptic ulcer therapy.

A large number of compounds have been tested with negative results but this paper contains the results obtained with two compounds which stimulate gastric secretion *per se* and one compound which inhibits the centrally induced secretion which normally follows the hypoglycemia caused by insulin.<sup>7</sup>

### METHODS

Adult cats having a permanent gastric fistula for the collection of gastric juice were used in these experiments after a preliminary fast of 18 hours. Total and free acid were determined by titration with N/10 NaOH. Gastric stimulation was produced by 2 units of insulin injected subcutaneously. The compounds to be tested were either injected subcutaneously or put into the stomach through the fistula as a powder two hours before the administration of insulin. The compounds stimulating secretion were given alone either orally or by injection. In testing compounds it was essential to give a dose which would not cause any effects such as ataxia or anaesthesia since any compound exerting an anaesthetic action will abolish the secretory response of insulin. The largest dose tolerated without causing any side effects was given to the cats whenever possible.

sufficient dosage to cause anaesthesia will prevent the secretion following insulin injection. Similarly if a slightly smaller dose is given and the animal becomes ataxic there is a partial inhibition of secretion. This effect is shown in Fig. 2. When sodium amytal was given in a dose of 35 to 40 mgm./Kg. by mouth a moderate degree of inco-ordination was produced and the response to insulin was below that found in control animals. Animals completely anaesthetized with amytal showed no gastric secretion following insulin. Doses of amytal of 20 to 30 mgm./Kg. which had no observable effect on the animal did not cause a reduction in the insulin effect.

(b) *Specific effect.*—Only 1 compound of those tested was found to inhibit insulin secretion when given in a dose which had no other effect on the animal. This compound No. 24-A, (1-methylbutyl) ethyl acetyl thiourea, in doses

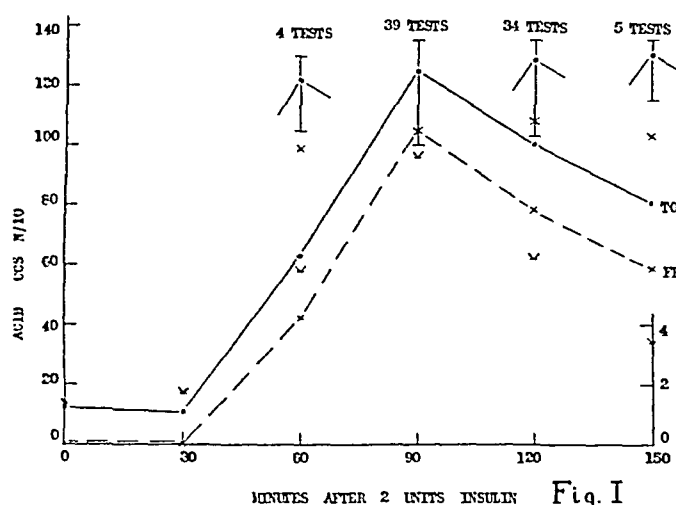
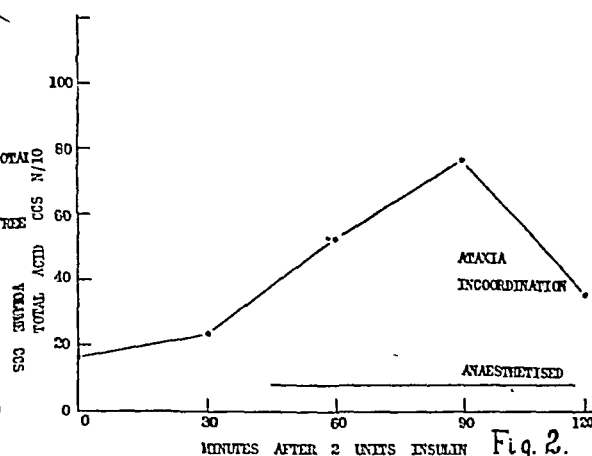


Fig. 1.—Insulin induced gastric secretion—82 tests on 8 cats. Curve shown is for average free and total acid, and volume when peak of secretion was reached at 90 minutes.

Fig. 2.—Effect of amytal on insulin induced gastric secretion—average of 4 tests.



### RESULTS

1. *Insulin induced gastric secretion.*—The secretory response to insulin has been determined in a large series of tests. Fig. 1 shows the average of 82 tests on 8 different animals. It will be noted that a profuse secretion occurred in every case although the peak occurred at different times after the subcutaneous injection of 2 units of insulin. In all tests a free acid of over 100 c.c. N/10 HCl was obtained. In most cases the height of secretion was reached after 90 or 120 minutes. The volume of juice was also markedly increased.

2. *Inhibition of insulin induced secretion.* (a) *Anaesthetic effect.*—Any compound if given in a

of 10 or 20 mgm./Kg. given orally inhibited the secretory effect of insulin without causing ataxia or anaesthesia, smaller doses were less effective. These results are shown in Fig. 3. It is of interest to note that such compounds as (1-methylbutyl) ethyl acetyl urea; (1-methylbutyl) acetyl thiourea, (1-methylbutyl) acetyl urea and thiourea were inactive.

A few observations were made on the effect of No. 24-A on gastric secretion induced by other means. There appeared to be little or no effect on secretion caused by pilocarpine or eating meat. Secretion produced by histamine was not inhibited but possibly reduced.

Further experiments of this type are in progress.

Preliminary observations on No. 24-A indicate that marked cumulatory effects may occur and various toxic manifestations are produced. In rats some interference with urinary excretion takes place with a resulting damaging action on the kidney.

3. *Negative compounds.*—Some 80 compounds have been tested on cats without showing any effect on gastric secretion except when doses approaching that required to induce anaesthesia were used. These substances were chiefly barbituric acid, thiobarbituric acid, and thiourea derivatives of representative types of compounds. Many of the more commonly used barbiturates were included.

animals anaesthetized with nembutal. These results are shown in Fig. 4. Inactive related compounds which were tested include: ethyl 3:3 dimethylallyl thiobarbituric acid, ethyl crotyl barbituric acid: ethyl 1:3 dimethylbutyl barbituric acid and thio derivative, and ethyl 2 pentenyl barbituric acid. Compound No. 16-A in a dose of 4 mgm./Kg. may cause other effects in cats, the animals may become excited, show a change in temperament and salivate. A more detailed study of these effects will be published separately.

Two cats were given No. 16-A following a dose of No. 24-A which inhibited insulin secretion. In this case no gastric secretion was found, so that the two substances appear to

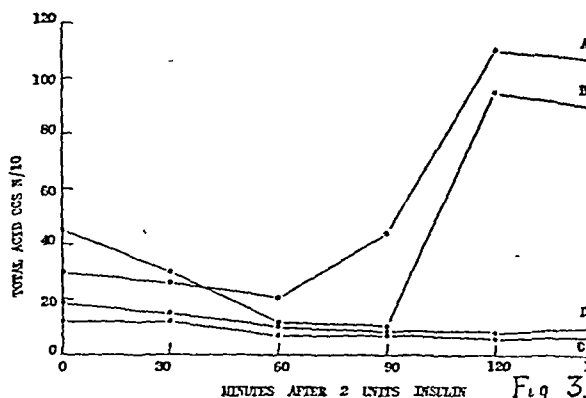


Fig. 3.—Inhibiting effect of No. 24-A on insulin induced gastric secretion. (A) No. 24-A 2.5 mgm./Kg. orally 2 hours before insulin, average of 2 tests. (B) No. 24-A 5.0 mgm./Kg. orally 2 hours before insulin, average of 2 tests. (C) No. 24-A 10.0 mgm./Kg. orally 2 hours before insulin, average of 2 tests. (D) No. 24-A 20.0 mgm./Kg orally 2 hours before insulin, average of 2 tests.

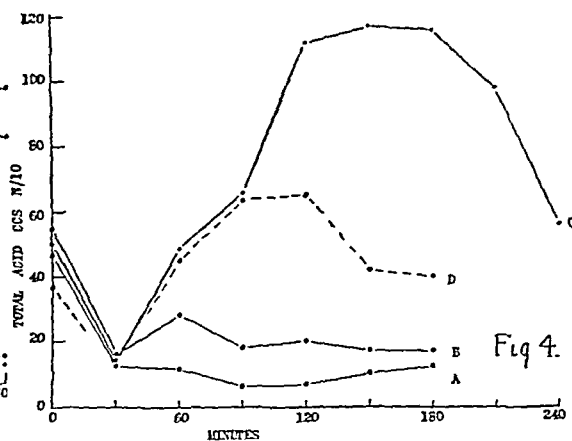


Fig. 4.—Gastric secretion produced by No. 16-A. (A) No. 16-A 0.5 mgm./Kg. subcutaneous injection—average of 2 tests—average total volume of juice = 11.6 c.c. (B) No. 16-A 2.0 mgm./Kg. subcutaneous injection—average of 2 tests—average total volume of juice = 34.4 c.c. (C) No. 16-A 3.0 to 4.0 mgm./Kg. subcutaneous injection—average of 2 tests—average total volume of juice = 68.9 c.c. (D) No. 16-A 4.0 mgm./Kg. orally—average of 2 tests—average total volume of juice = 62.5 c.c.

4. *Gastric secretion produced by barbiturates.*—Of the compounds tested, 2 were observed which induced gastric secretion *per se*. These were No. 16-A, ethyl 3:3 dimethylallyl barbituric acid and sodium salt and No. 21-A, ethyl 1:3 dimethyl-1-butenyl barbituric acid. The former substance in doses of 3 to 4 mgm./Kg. given subcutaneously caused a profuse gastric secretion with high acidity whereas smaller doses were less effective. Orally the substance showed activity about one-half as great as when injected. No. 21-A gave similar results on injection although somewhat larger doses were required. No gastric stimulation could be produced in

have an antagonistic action on gastric stimulation.

#### DISCUSSION

The results reported describe in detail some new properties of certain barbiturates and a thiourea derivative. These concern gastric stimulation or inhibition of insulin induced gastric secretion. The mode of action of these compounds has not yet been worked out although it seems probable that the effect is of central origin. Compounds 16-A and 21-A are powerful gastric stimulants and act orally, the volume and acidity of juice being as great or more so than that caused by histamine. A

hypoglycemic action of these substances was not found to be the stimulus of secretion. Salivation and other effects of the compounds have been noted and the stimulatory action appears complex. Substance 24-A was the only one found to inhibit the secretion which follows the injection of the above compounds and also that caused by insulin. This effect also would appear at present to be of central origin. It seems of interest that the commonly used barbiturates were without effect on gastric secretion until near anaesthetic doses were used. The barbiturate and thiourea groups of compounds appear of particular interest for further research on their mode of action. It seems likely that suitable compounds may be found which through a specific central depression of gastric secretion may be used for the treatment of peptic ulcer. The possibility of other specific actions on brain centres is at present under investigation.

#### SUMMARY

1. Of 80 barbiturates, thiobarbiturates and thiourea derivatives only 2, No. 16-A ethyl 3:3 dimethylallyl barbiturate and No. 21-A ethyl 1:3 dimethyl-1-butenyl barbiturate were found which caused a profuse gastric secretion in unanaesthetized cats.

2. The stimulatory action of insulin on gastric secretion was studied on cats. One compound No. 24-A (1-methylbutyl) ethyl acetyl thiourea inhibited the stimulating effect of insulin without causing any other untoward effect. Other substances did not inhibit such secretion until the dose given was large enough to cause ataxia or anaesthesia. No. 24-A also inhibited the secretory action of No. 16-A.

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Compounds 24-A, 16-A, and 21-A were kindly prepared and supplied by the Lilly Research Laboratories, Eli Lilly Co., Indianapolis, U.S.A.

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Too much stress cannot be laid upon environment in the prevention of tuberculosis, but the word must be interpreted in the widest terms. It includes adequate housing, water supply, proper ventilation, absence of overcrowding.

## THE WORKINGS OF THE ONTARIO CANCER FOUNDATION, PILOT CLINIC AT KINGSTON\*

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IN 1931 a committee to study cancer was appointed by the Ontario Government under the leadership of the then Minister of Health, Dr. Robb. This committee travelled to Europe to study methods used in the large centres of that time. This included London, Paris and the Radium-Hemmet in Sweden. Centres in United States were also visited. Following this the Ontario Institutes of Radiotherapy were organized. To begin with they were at the University centres, namely, Toronto University, Western University and Queen's University. Later four other centres were added, making seven in all. Centres outside the Universities were at Hamilton, Ottawa and Windsor.

These Institutes were operated mainly to make the most recent therapeutic methods by x-ray and radium available to the public. The Government assisted by supplying the radium free to the hospital in which the Institute was situated and by making a grant to each of these seven centres. The Department of Health required annual reports from each of the centres on its activities.

In 1943 by an act of Provincial Parliament the Ontario Cancer Treatment and Research Foundation was established. It is a non-share capital, non-profit making corporation. The object of the Foundation as set forth in its charter is to conduct a program of diagnosis, treatment and research in cancer including:

- (a) The establishment of a hospital centre with facilities for diagnosis and active treatment.
- (b) The laboratory and clinical investigation of cancer problems.
- (c) The co-ordination of facilities for treatment.
- (d) The establishment of diagnostic centres in general hospitals or elsewhere.
- (e) The adequate reporting of cases and the recording and compilation of data.
- (f) The education of the public and the importance of early recognition and treatment.
- (g) The providing of facilities for undergraduate and postgraduate study.
- (h) The training of technical personnel.
- (i) The providing and awarding of research fellowships.

\* Read at the Seventy-ninth Annual Meeting of the Canadian Medical Association, Section of Radiology, Toronto, June 23, 1948.

(3) The transportation of patients and necessary escorts to treatment centres for diagnosis, treatment and investigation.

One of the steps that the Foundation has taken up to the present to implement the provisions of the Act may be briefly summarized as follows:

The Advisory Medical Board has drafted plans for the operation of cancer clinics which constitute a new experiment in medical organization. These plans are being put into effect at the Ontario Cancer Foundation, Kingston Clinic which opened in March, 1947 in the new wing of the Kingston General Hospital. The Clinic was opened by the Minister of Health on March 28, 1947.

*Housing.*—When in 1945 the Minister of Health, Dr. Vivian, first asked the Foundation to set up an all-inclusive cancer clinic, each of the centres was asked if it could undertake such a venture. In Kingston the members of the Staff of Queen's University, Medical Faculty agreed that such was possible and it so happened that a new wing was being built by the Kingston General Hospital and the Board of Governors were kind enough to allow the Foundation the use of part of the ground floor for this purpose. The agreement between the hospital and the Foundation reads that the rental shall be \$1.50 per square foot of floor space. For this rent the hospital has provided the plumbing, heating and lighting. Cleaning is paid for by the Foundation. The only other payment of the Foundation to the hospital is \$1.00 per day for each cancer patient in the wards of the hospital to cover the extra cost of dressings and drugs.

*Professional staff.*—The Foundation has agreed that the professional staff shall be designated by the local medical society or by the University and that the names shall then be submitted to the Foundation for final approval. In the case of the Kingston Clinic the personnel were chosen by the Medical Faculty of Queen's University. Actually, the head of each Medical Department on the Faculty became the head of the same department for the Clinic, and he was allowed to choose his own associates. The Departments include medicine, surgery, gynaecology, pathology, anaesthesiology, ophthalmology, otolaryngology, urology, paediatrics and radiology. The Foundation also appointed a director.

*Timetable.*—A timetable has been arranged for the staff. In surgery, for example, the schedule is divided so that each surgeon has

two days per week on call with the clinic. If a surgical patient comes to the clinic, he is referred to the surgeon who is on call for that day, unless he names his preference. Payment to surgeons is on a fee-for-service basis. Consultation on a new patient is \$10.00 and operative procedure is at the minimum Ontario Medical Association schedule of fees. The surgeon presents his bill to the financial secretary of the clinic and he in turn charges the patient; the surgeon receives that percentage of his bill which the patient pays of the total bill presented. For example, if the patient can pay only half of the total bill, the surgeon will receive only half of the fee for surgery. No fee is paid to surgeons for attending clinics and for seeing "follow-up" cases. No money is paid to any of the professional staff except as it may come in the fee-for-service from the patients. Patients paying less than 25% of the total charge are considered non-pay and professional staff receive for these no remuneration. The one exception to this is the Director, who receives a certain stated amount for directing the activities of the clinic along with the fee-for-service for patients treated by radiotherapy.

This system of payment has been worked out with the staff of the Clinic and appears to operate satisfactorily. If a patient is admitted to the public ward of the hospital, the surgeon or physician, who is also on the staff of the hospital and of the University, makes no charge. This is part of his agreement with Queen's University. The physicians on the staff have agreed that any cancer patients referred to them directly shall automatically become clinic patients, regardless of whether they are private, semi-private or ward. Consultations are arranged between physicians on the staff by appointment. There is no board of doctors arranged who will sit and review the patients except at the weekly staff meeting held on Thursday afternoons when any interesting or controversial cases or problems are presented and discussed. At other times the Director or his representative may call the member of the staff most interested to see the case with him. On the other hand the members of staff may call other members of staff or the radiotherapist in consultation on cases which they have. These consultations are recorded on the patient's records.

The first consultation is the only one for which the patient is charged a fee. The amount for consultation will not, therefore, exceed \$10.00 in any one case.

The Clinic has its own business office. The personnel includes a financial secretary. He is a young man recently returned from the Services who had considerable training in accountancy. In the same office is a receptionist, a young lady who has some high school training but no special stenographic certificates. She welcomes the patients and refers them to the waiting room and notifies the nurse at the desk where examinations are carried out when the patient has arrived. She also operates the telephone switchboard and she helps the accountant as one of them often has to be away to take funds to the bank when either one assumes the duties of receptionist and telephone operator. The method of financing and recording in the main office includes the following:

(a) A special ledger sheet is made out by the stenographer at the examination desk and when patient has completed her stay with the clinic, the ledger sheet is passed along to the business office. This is the first indication that the office has of the charge to the patient. A charge sheet is then made out showing for each patient the charges for each particular service performed.

(b) If the patient has a second treatment at a later date, a repeat sheet is used which has a record of this additional treatment and the charge for the same.

(c) The patient may then pay the bill and is given a receipt.

(d) Filing cards are kept on each patient showing the condition of the charge, that is, whether it has been paid at once or whether there is some special instruction as to how the patient wishes to pay at a later date.

(e) A cash receipts book is kept which records all cash received for treatment and on account.

(f) A cash disbursement book is kept which records all cash payments.

(g) A general ledger shows all real and nominal accounts.

(h) An equipment ledger shows all therapy equipment, furniture, and fixtures which have been purchased and the price of each and data of purchase.

(i) A general journal is kept to journalize all non-cash transactions.

At present we are encouraging the doctors on the staff to make all charges on clinic patients through the clinic. When a doctor completes his work he fills out a charge form sheet with the service performed and the amount of the bill and sends it down to the clinic. This then is added to the charge against the patient and collected if possible. The doctor receives the percentage of his bill which it bears to the percentage of the total bill which was paid.

A patient who pays 25% of the total bill is considered to be an indigent case and no money is paid to the physician. There is a little difference in the x-ray work in that the cost of doing work is considered to be too great to cancel the bill and to expect the x-ray department to carry the financial burden for non-pay cancer patients. It has, therefore, been agreed that the clinic shall guarantee that the x-ray department receive at least 50% of its bill. This 50% is considered to be the non-professional part of the cost of x-rays. The professional portion is dealt with the same as fees to other specialists on the staff of the clinic.

Monthly the following work is carried out by the office staff: (1) The statement of revenues and expenditures are completed for the clinic. (2) Statements of accounts are forwarded to patients who owe funds to the clinic.

When the patient completes examination or treatment and is ready to leave the clinic, he is asked to report at the business office where he will receive his return appointment card. This is arranged so that the patient may be met by the financial secretary who can then discuss any points of financing with the patient. We have made an effort to help the patient to decide what portion of the bill he can pay and to avoid placing heavy financial charges on those who are not able to deal with them readily. Any information at such conferences between the patient and the financial secretary is recorded on the reverse side of the patient's ledger sheet and also on the index cards noted above.

All cash disbursements and receipts are recorded in duplicate. The carbon copy is then sent to the head office in Toronto along with the monthly statement.

The clinical records are kept by a recording secretary who has as assistant, one full-time stenographer who is at the examining desk and a part-time stenographer who assists the secretary in the Records' Room. It is the duty of the stenographer at the examining desk to arrange all appointments of patients and to receive notification from the business office by telephone when a new patient has arrived. This stenographer will then get from the files the chart of this patient if she has been present previously and, if not, will get what informa-

tion she can on a new chart. She will notify the nurse-in-charge who will see that the patients are brought in in the proper order into the examining room where they may be seen by the consulting staff. The consultant sees the patient, makes what examinations are necessary, whether follow-up or on first visit, and dictates his findings to the stenographer at the examining desk. He may also make out any x-ray requisitions or arrange for further special examinations and for photographs by the Audio-Visual Department of Queen's University. He may then or later decide which staff member to call in consultation. He may also arrange for the patient to be admitted to hospital if it seems necessary. When the work has been completed the patient is referred back to the waiting room and a telephone call put through to the receptionist who will make out the return appointment card with the time given to her by the stenographer at the examination desk and will see that the patient is contacted by the financial secretary. When the examination stenographer has completed the records with notes by the consultant and any special diagrams filled in with position of tumour, and other data, the charts are then taken to the records' secretary.

This secretary gives new charts a number, which in the case of malignant diagnosis is the year and the number of the case afterward, e.g., 48-1. Names of all malignant cases are entered alphabetically in a record book and the number is placed opposite the name so that the chart may be quickly obtained from the files. The records' secretary also makes out a record card for the various sites of cancer according to forms supplied by the Ontario Department of Health. Once a year these cards are sent in to the Medical Statistician, Department of Health, Parliament Buildings, Toronto, and from these statistics of the Ontario Institutes of Radiotherapy and the Kingston Cancer Clinic are compiled.

Another record form is also kept by the records' secretary for all malignant cases and from this may be determined the number who come for diagnosis only, for diagnosis and treatment, the number for follow-up, the number of biopsies taken, urinalyses, autopsies, clinical photographs and number of days hospitalized. This is for statistical purposes and

is based on requests received from the Department of Health in previous years. Immediately after the record is filed, a letter is written to the patient's doctor explaining what has been done and what the future disposal of the case may be.

Several form letters are sent out; one notes that the patient has not kept his appointment and asks if we might arrange another for him. If the patient does not report we may write to the doctor who referred the case asking the condition of the lesion and whether or not there are any complications. If we have not seen the patient at the time of the anniversary of treatment, a letter is sent out asking the condition of the lesion treated. Most of the malignant cases are recalled over a period of five years but in the case of certain ones, e.g., carcinoma of the cervix, carcinoma of the breast, we may continue for ten years. The physical details of the clinic are as follows:

The hospital wing is 56 feet wide. Because of this there are two halls with a central block of small rooms without outside windows. In this section are dressing rooms, a waiting room for patients having radium treatment and a dressing room for female members of the staff.

On the west side of the building are the business office, the waiting room, dressing cubicles with direct access to two examining rooms, the examining secretary's desk and radium supply and beyond that a small operating room. On the east side are the three x-ray treatment rooms, a men's room, some storage space and cleaners supplies and also the intake fan for the air circulating system. There is also a second waiting room for patients under treatment.

The rooms for the 200 K.V. and 400 K.V. x-ray treatment machines have  $\frac{3}{4}$  inch lead protection reaching from the terrazzo up 7 feet. There is no lead in the ceiling which is of re-inforced concrete. A space 9 feet wide was left between these two rooms where the two controls are installed. One technician easily operates the two machines. Test readings taken during the operation of both machines showed that the technicians test there is only about 5 milliroentgens of stray irradiation in 8 hours.

On the 400 K.V. side there is twice the lead protection opposite the operator's desk. To avoid puncturing this, an opening was made above the lead and a mirror so placed that the technician may see the port of the 400 K.V. machine as she sits at her desk. A window with two thicknesses of lead glass allows adequate observation of treatments in 200 K.V. machine room.

At the south end of the clinic there are two rooms, one for the Director and a larger one for the use of the records staff. This record room is large enough to be used as a study and library and the weekly meetings of the medical staff of the clinics are also held in this room.

The radium supply consists of 590 mgm. of radium owned by the Department of Health of Ontario.

The x-ray machines include the 200 and 400 K.V. instruments already mentioned and a 110 K.V. superficial type machine.

Communication is by telephone with a switchboard operated from the business office. A signal bell is used to call members of the staff to the telephone.



The air is circulated by intake and exhaust fans and this feature has proved to be of great assistance.

In conclusion, I would like to thank the Ontario Cancer Foundation for their unsparing efforts to make this a well equipped and useful clinic, and to thank the professional staff who are co-operating so well and thus assuring its efficient operation.

## ANÆSTHESIA FOR BRONCHOSCOPY AND ŒSOPHAGOSCOPY\*

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LARYNGOLOGISTS are occasionally confronted with extremely nervous and unco-operative patients who hold themselves tense, seem unable to relax the lower jaw and neck muscles and have spasm of the cricopharyngeus muscle. Under such adverse conditions, a satisfactory bronchoscopic examination cannot be done under local anæsthesia alone. In adults, the use of inhalation anæsthesia has not proved satisfactory for this work, since the degree of anæsthesia must be deep in order to provide sufficient relaxation, and to overcome reflexes which may cause dangerous spasm when the bronchoscope is introduced. As many of the patients requiring bronchoscopic examinations have had prolonged coughing spells, considerable difficulty is usually experienced in anæsthetizing them with inhalation agents. When ether is used, the patients have a prolonged recovery period with much nausea and vomiting. This seems unjustified for these short and simple diagnostic or therapeutic procedures. Furthermore, it is risky to use a bronchoscope in the presence of an explosive inhalation agent.

The advent of curare and sodium pentothal has greatly aided the anæsthetist in providing general anæsthesia for this type of work. Curare has a selective action, the muscles of the head and neck being relaxed before those of the rest of the body. Paralysis of the respiratory muscles need not occur with the small doses which are

sufficient for endoscopy. If the patient is willing to co-operate to some extent, but has difficulty in relaxing his jaw and neck muscles, the use of curare with cocaineization of the throat, would be sufficient for the examination. However, since practically all of these patients demand to be asleep, the added use of sodium pentothal is necessary.

The secret for the successful use of the curare-pentothal combination for laryngoscopy, depends upon the thorough spraying of the patient's pharynx and larynx with cocaine or similar drugs. Cocaine in 5 or 10% strengths, or 2% pontocain, are the local anæsthetics most generally used. A pledget of cotton soaked in the solution is held in both pyriform fossæ, followed by a thorough application to the back of the epiglottis and arytenoid cartilages. The vocal cords are sprayed and 1 c.c. of the solution directly instilled into the trachea. It is essential that the patient be allowed to wait at least ten minutes after the throat has been sprayed to allow the local anæsthetic sufficient time to take effect. If the local anæsthetic has not been thoroughly applied, or if sufficient time is not allowed for it to have maximum effect, reflexes in the pharynx or larynx are stimulated which may result in dangerous spasm and troublesome coughing. These patients should have premedication consisting of nembutal by mouth and atropine and morphine by hypodermic or intravenous injection. If the atropine is omitted, copious salivation develops, which may cause coughing during and after the examination.

A review of a series of 100 consecutive cases of bronchoscopic and œsophagosopic examinations, performed during the last two years, showed that 1/4 of the 52 bronchoscopic examinations, and 1/3 of the 48 œsophagosopic examinations, required general anæsthesia. The local-curare-pentothal technique was used in 75% of the cases requiring the general anæsthesia, 5% received sodium pentothal alone, an additional 5% received local and sodium pentothal, and the remaining 15% received inhalation anæsthesia.

The form of curare used was d-tubocurarine chloride (Tubarine-Burroughs-Wellcome) which has 10 mgm. of the crystalline drug per c.c. This drug was injected intravenously and the dose was estimated according to the age and

\* Presented at the Seventy-ninth Annual Meeting of the Canadian Medical Association, Toronto, June 23, 1948.

muscular development of the patient. The usual dose was found to be 10 mgm. or 1 c.c. A period of from one to two minutes is allowed to elapse for the curare to have some effect before the patient is put to sleep with sodium pentothal. A 5% solution of sodium pentothal is injected slowly into another vein until the patient's lid reflexes have disappeared. To facilitate the administration of curare and sodium pentothal, an intravenous of saline may be started and the drugs injected through the tubing. In this way, only one vein is used, and the needle is kept open by the continuous saline drip. It is important to allow a period of at least five minutes to elapse from the time the curare is injected before the bronchoscope is inserted, in order to permit maximum relaxation and anaesthesia. If the patient begins to strain when the bronchoscope is introduced, an additional dose of sodium pentothal is given. If relaxation is not adequate, an extra dose of curare is also necessary. Since both of these drugs depress respiration and may cause dangerous anoxia, a close watch must be kept on the patient at all times. If an overdose of either drug has been given and cyanosis has developed, the examination must be interrupted and an intratracheal tube inserted through which oxygen is given under pressure until spontaneous breathing has been restored. The delivery of oxygen through the side of the bronchoscope will help maintain the patient's colour during the examination.

The following cases of bronchoscopy were performed, using the local-curare-pentothal technique:

#### CASE 1

Male, aged 58, weight 170 lb. This patient had a history of cough for three months, and the x-ray showed a mass in the right lung. He was given preoperative sedative consisting of nembutal, morphine and atropine. The throat was sprayed with 5% cocaine. After ten minutes, 10 mgm. of d-tubocurarine chloride were injected intravenously. Patient was then put to sleep with sodium pentothal, a total of 500 mgm. being necessary before the lid reflexes had disappeared. Five minutes after the curare had been given the bronchoscope was introduced through the glottis and into the trachea without the occurrence of spasm or coughing. As the bronchoscope entered the trachea, the breathing deepened and another 150 mgm. of sodium pentothal were given to offset any danger of coughing or straining. An additional 5 mgm. of d-tubocurarine chloride were also given at this time to assure better relaxation of the neck muscles. Throughout the bronchoscopic examination, the breathing was quiet but adequate. The bronchi were explored and a biopsy of the mass in the right lower lobe taken without difficulty. The scope was in position for a total of ten minutes and a further 350 mgm. of sodium pentothal were given during this period to keep the anaesthetic at an adequate depth. During the entire

examination, a total of 15 mgm. of d-tubocurarine chloride and one gram of sodium pentothal were given. When the bronchoscope was withdrawn, breathing continued quiet and regular. No spasm occurred and the colour remained good. Patient made a rapid recovery with no unpleasant after-effects.

#### CASE 2

Female, aged 58, weight 125 lb. This patient had repeated attacks of pneumonia during the past five months. X-ray showed an area of density in the right middle lobe. She was extremely nervous and apprehensive. Preoperative sedative consisted of nembutal, pantopon and atropine. Her throat was sprayed with 5% cocaine. Ten mgm. of d-tubocurarine chloride were given intravenously, followed by 250 mgm. of sodium pentothal. The bronchoscope was introduced five minutes after the curare had been given and slight spasm of the vocal cords occurred, but these readily relaxed. A total of 750 mgm. of sodium pentothal were used during the ten minutes required for the examination. No further curare was needed. Patient was found to have a collapse of the right middle lobe with much secretion filling the bronchus. When the bronchoscope was withdrawn, coughing occurred, followed by moderate cyanosis which required the administration of oxygen for a few minutes. Patient was then returned to her room and recovery was uneventful.

The local-curare-pentothal combination has also proved of great value for œsophagoscopy examinations. The breathing is quiet and regular and the colour remains good. Less curare and pentothal are required than for bronchoscopy. In this series of cases, no coughing or obstruction to the airway occurred, and the patients were returned to the ward conscious and in good condition. Examinations were performed in this series for the removal of foreign bodies such as dentures, pieces of meat and bones, spoons, and for the examination of the lower end of the œsophagus for ulceration, new growths or diverticuli.

The following cases are representative of the series.

#### CASE 1

Male, aged 16, weight 155 lb. This patient had swallowed a partial denture three hours before coming to hospital. X-ray located the foreign body in the post-cricoid region of the œsophagus. Preoperative sedative was given, consisting of nembutal, morphine and atropine. Ten minutes after the throat had been cocaineized, 10 mgm. of d-tubocurarine chloride were given intravenously, followed by 150 mgm. of sodium pentothal. A total of 500 mgm. of sodium pentothal were necessary before the lid reflexes had disappeared. A large œsophagoscope was introduced which caused slight movement in the patient's shoulders, necessitating another 150 mgm. of pentothal. The denture was located and removed without difficulty. Patient's colour and breathing were good throughout and he was awake and talking within ten minutes after the operation.

#### CASE 2

Male, aged 45. He was flown to Toronto with a probang stuck in the œsophagus, the lower end opposite the bifurcation of the trachea. A piece of meat had lodged in his œsophagus a few hours earlier and the probang had been used in an effort to dislodge this foreign body.

However the instrument became jammed in the œsophagus and could not be moved. The throat was sprayed with pontocain, and this was followed by sodium pentothal intravenously. After one hour of manipulation, the probang was finally removed from the œdematous œsophagus. A total of  $1\frac{1}{4}$  gm. of sodium pentothal was required. No curare was used. The patient made an uneventful recovery.

#### CASE 3

Male, aged 17. This patient was brought to Toronto from a mental institution with a teaspoon jammed in his œsophagus. The spoon had been bent double with the open end towards the mouth. The patient was unco-operative and general anæsthesia was imperative. The throat was sprayed with pontocain, followed by curare and sodium pentothal intravenously. After twenty minutes of manipulation, the foreign body was removed.

In conclusion, we have found that the technique of using local-curare-pentothal has greatly simplified the performance of bronchoscopic and œsophagoscopy examinations on nervous and unco-operative patients. Good relaxation is provided and the patient is asleep. Recovery is rapid and there are no unpleasant after-effects. However, it is essential that the anæsthesia not be rushed, and that adequate time be allowed after each of the drugs is administered, to have maximum effect before the examination is commenced. Close vigilance must be kept to prevent anoxia, and a gas machine equipped for intratracheal intubation must be at hand for immediate use.

### CANCER OF THE VULVA\*

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THE vulva is one of the less frequent sites for cancer in the female genital tract. It is interesting, therefore, to see an increasing number of papers on cancer of the vulva in the last few years. This reflects the developing interest in the whole problem of cancer and is also due to the fact that in modern clinics the prognosis for this lesion is very much better than was the case some years ago. Ewing<sup>1</sup> quotes Schulze in 1903 reporting only 14 cases of a series of 114 surviving after five years and Deitrich in 1905 stating that there were no reported survivals

over six years. A great change took place following Basset's<sup>2</sup> classical paper in 1912, which inaugurated the modern era of surgical treatment. His name is almost as closely associated with the successful surgical treatment of cancer of the vulva, as is that of Wertheim or Schauta with cancer of the cervix. This is to no small extent due to the work of F. J. Taussig of St. Louis whose numerous publications on every phase of cancer of the vulva have provided a foundation for any further advance that may be made in the study and treatment of this disease.

It is usually true that cancer which grows on the surface of the body is diagnosed at an earlier stage than when it originates in a deeper situation. This is considerably modified however, when the site is covered by clothing and especially when the lesion develops on the external genital area of an elderly woman. Whereas we have seen some patients under 50 years of age, the average age has been 63 with nearly one-third of the patients over 70 years of age. They comprise a group who will not be readily influenced by an educational campaign. Their conduct is controlled by natural reticence, ignorance, fear and in many cases senility. So that not infrequently an advanced lesion is only discovered in the routine examination of some old woman brought with a terminal illness to the medical wards of the hospital.

In the study of a disease there is a natural tendency to develop definite ideas with regard to the warning symptoms typical of the disease. Thus we associate irregular bleeding with cancer of the cervix and we complete a triad with vaginal discharge and pain as indicating further progress of the tumour. One is constantly impressed, however, with the number of patients suffering from cancer of the cervix in whom bleeding only occurs in a terminal phase of the disease. In others, pelvic pain which may have been the only cause for the patient seeking advice, has had nothing to do with the malignant lesion and in others vaginal discharge has been of such long duration that it is a reasonable conclusion that it was due to a benign condition long antedating the cancer. We have seen 152 women suffering from malignant disease of the vulva from 1929 to 1947. The histories have not always been reliable as many of the patients were of advanced years and others obviously were poor observers. But

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it is significant that over half of the patients had symptoms for over a year and many for extremely long periods of time even up to twenty and twenty-five years. The commonest prolonged symptom is irritation of the vulva usually described as pruritus vulvæ, but in some cases, particularly when the lesion involves the vestibule taking the nature of a dysuria. The second most frequent manifestation of long duration is a nodule, lump or tumour of the vulva. Sometimes this is not sensitive but at other times pain is early associated with such a tumour. We have observed that there is very little relationship between the duration of these symptoms and the extent of the growth and we interpret this as signifying that chronic benign lesions of the vulva frequently precede the onset of cancer and that the rate of growth of cancer of the vulva is often exceedingly slow.

It has long been recognized that cancer of the vulva often develops in association with leukoplakia vulvæ.<sup>3</sup> This chronic irritative lesion presents features of an unstable condition of the skin which can be recognized both clinically and microscopically as a likely starting point for cancer. Approximately 30% of our patients had leukoplakia and it is reasonable to believe that a detailed histological study would have shown a much higher incidence.

The satisfactory treatment of any disease depends on a knowledge of its cause. Very little is known of the etiology of leukoplakia vulvæ and the number of therapeutic agents which have been used to treat it indicates the ineffectiveness of any one. On the belief that the condition is due to lack of œstrin, œstrogens have been used extensively both orally and in ointments. This presents the paradox of treating a precancerous lesion with a carcinogenic agent, but in the amounts used this feature is probably negligible. While it is true that leukoplakia is most often seen after the menopause, it is also encountered in young individuals and even during pregnancy.<sup>4</sup> The study made by Norman Miller<sup>5</sup> also indicates very strongly that a lack of œstrin is not an important etiological factor. Similarly the theory that a lack of vitamins is responsible cannot be substantiated by laboratory investigation. The treatment of leukoplakia, therefore, remains empirical. Good results have been re-

ported by the advocates of every method of treatment, but it is also true that left to itself, the condition shows periods of regression and return.

Taussig<sup>6</sup> stated that 50% of cancer could be prevented by the surgical treatment of leukoplakia. The basic truth of this assertion is unquestionable. We agree with it because we have seen too many patients who have been treating themselves for years with bland ointments often on the advice of a physician finally coming for treatment with far advanced cancer. It should be borne in mind, however, that vulvectomy often results in such distortion that sexual life is ended and whereas this may be of minor importance in elderly women, it presents a real problem in younger patients. It is also true, that the removal of all the skin involved by leukoplakia will not prevent a recurrence, as the skin which is drawn in to cover the raw surface often develops the condition in a short period of time. It may be safe to temporize under some circumstances in an attempt to alleviate the conditions by non-surgical means. This demands repeated examination of the area to avoid the possibility of a progressive lesion undergoing malignant change. Until a specific remedy is discovered vulvectomy is accepted as the best means of treating intractable leukoplakia.

The diagnosis of cancer of the vulva is usually very easy. As a rule the lesion is well developed and presents such an appearance that its serious significance cannot be overlooked. If there is any question as to its nature, biopsy provides a prompt answer. An early lesion may not be as readily recognized especially when it is masked by leukoplakia. But the presence of a raised macule or a fissured ulcer always demands biopsy before dismissal.

We have treated 124 patients suffering from cancer of the vulva up to the end of 1947. A detailed account is presented here to explain why 21 other patients who were seen in the clinic were not treated and are not included in a consideration of the results of treatment. Eight patients were in such condition that they died shortly after admission. They were elderly women and several were suffering from severe organic disease so that the cancer of the vulva was only an associated cause of death. Six patients had been treated in other hospitals by surgery or irradiation and were finally

brought to the clinic when those who had treated them considered the condition hopeless. After we had examined them we were of the same opinion. Three women refused treatment. One patient had been treated in another clinic for hydradenoma and is living and well seven years later. We have been interested in following the further course of this patient, but we had nothing to do with her treatment. Another patient was treated for a clinically diagnosed cancer of the vulva and is surviving eighteen months after treatment. No biopsy was obtained and the diagnosis, therefore, lacks confirmation. One patient came from a mental institution and was uncontrollably irrational. She had a huge lesion with massive involvement of the glands on both sides, one side being extensively ulcerated. Another old woman eighty-four years of age, was admitted with a severe heart lesion. On examination a very advanced cancer of the vulva was discovered. She was considered utterly unfit for treatment.

All authorities<sup>7</sup> agree that the worst examples of inexcusable delay and faulty treatment occur in cancer of the vulva. Forty-six patients who came to this clinic had undergone various forms of treatment which in the light of our present knowledge must be considered inadequate. These women had been treated with ointments, vaccines and pills. Many had had repeated local excisions of tissue. Others had partial or simple vulvectomy, and when gland excision was undertaken, the bilateral nature of the lymphatic drainage was forgotten. The cautery and local irradiation also had not contributed to anything more than delay. It appears difficult for some physicians to appreciate the seriousness of the surgical problem presented by cancer of the vulva. There is no place for treatment based on the old precept "Here a little and there a little". Cancer of the vulva is a slowly growing radio-resistant tumour developing in tissues which have an ill-defined limit and free lymphatic drainage. Local recurrences are inevitable if wide excision is not effected. Lymph node metastases appear often after a surprisingly long latent period and when the lesion involves the anterior portion of the vulva, the spread may be contralateral.

It is only natural that in a clinic which has a dual foundation in the Institute of Radiotherapy and the Department of Gynaecology, a number

of patients will be treated by radiotherapy. Experience over a matter of years, however, has led to the opinion that surgery is the correct method of treatment and whenever possible, a radical vulvectomy with bilateral block dissection of the gland-bearing tissues of the inguinal region and Scarpa's triangle is performed.<sup>8</sup> Special care is taken to clear the femoral canal to the cribriform fascia. The result of this operation has been a five year survival rate of 64% and of those patients operated upon during the last five years, on whom a five year rate cannot yet be calculated, 73% are alive.

Prior to 1935, no radical operations were performed but since then there has been an increasingly wider application of the operation. Between 1935 and 1943, 49% of the patients were treated by radical vulvectomy, but in the last five years this has risen to 62%. This has been the result of treating more patients suffering from advanced lesions. Prior to 1943, only 26% of the patients with advanced lesions were operated upon, but since then, 62% of such lesions have been treated by surgery. Several patients have required colostomy prior to vulvectomy to permit complete extirpation of the tumour. Age also is less of a deterrent: recently an operation was performed on a patient of eighty-two years of age with no untoward effect. There are still a number of patients however, for whom radiotherapy offers a satisfactory method of treatment, considering the combination of their age and physical state. In some of these, we have combined irradiation of the primary lesion with bilateral gland excision. There are others also with so extensive involvement that a cure is impossible and for these radiotherapy is a means of palliation.

In the 19 years under review, our ideas have become clarified with regard to many of the problems of treating this disease. As a result of a more uniform method of treatment the five year survival rate of all the patients treated, has risen from 21% prior to 1935, to 40% up to 1943, and at present, of those patients treated in the last five years, 60% are alive and well.

We have encountered seven cases of malignant melanoma of the vulva. These tumours are often reported with cancer of the vulva, but should be considered separately as they form a class by themselves entirely apart from any other tumour.<sup>10</sup> In other situations the majority of malignant melanomas arise from a pre-exist-

ing pigmented mole. But as the vulva is a situation where moles are rare, it is altogether likely that the melanoma develops here without any benign precursor.

Our experience in treating this tumour has been very disappointing. Radical vulvectomy, lymph adenectomy, diathermy, radiotherapy have all been futile. Only one patient has survived over two years and she is an old woman of 81 from whom only recently a secondary nodule has been removed.

The observation of this group of patients emphasizes some important facts regarding malignant disease of the vulva. Irritation of the vulva always demands an examination to determine the cause. If leukoplakia exists, it is of serious significance and the possibility of malignant change should be constantly kept in mind. The presence of a proliferative or ulcerative lesion of the vulva requires a positive diagnosis which may not be possible without biopsy. If cancer is diagnosed, nothing short of radical vulvectomy and double lymph adenectomy is justifiable. The results of treating malignant melanoma are so bad, that more radical surgery than we have as yet undertaken is probably indicated.

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## CASE REPORTS

### MASSIVE HÆMORRHAGE FROM GASTRO-INTESTINAL TRACT FOLLOWING A COMPOUND FRACTURE\*

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The occurrence of gastric hæmorrhage as a complication following severe or multiple fractures was first reported by Wangenstein<sup>1</sup> in 1945. We have been unable to find any further

reference to this condition, and it would appear to be a sufficiently rare and interesting complication to warrant reporting the following case.

Male, aged 18, was admitted to the Jewish General Hospital on February 2, 1947, 12 hours following a skiing accident involving the left lower extremity. Upon admission, the patient was pale, cold, apprehensive and appeared to be in a condition bordering on shock. Blood pressure 135/80, pulse 110, respirations 22, hæmoglobin 107%.

Examination of the left lower extremity revealed a compound fracture involving the lower third of the left tibia and fibula. The remaining physical examination was essentially normal. X-ray examination showed a compound, comminuted spiral fracture of the lower third of left tibia and a double fracture of the left fibula, with considerable displacement of the fragments.

Patient was immediately given 1,500 c.c. of 5% glucose in saline and under general anaesthesia a careful debridement of the wound was performed and Kirschner wire traction applied through the os calcis. The extremity was then suspended on a Braun splint. The postoperative condition was satisfactory. Subsequent x-rays revealed an incomplete reduction of the bony fragments. Sixteen days later, an open reduction and bone plating was carried out under general anaesthesia. There was no unusual loss of blood and the patient returned from the operating room in good condition.

He reacted very well and appeared to be making an uneventful recovery until February 25, one week later, when it was noted that he looked extremely pale and complained of marked weakness, headache and excessive thirst, and obviously appeared to be suffering from a sudden severe loss of blood. He had no pain and there was no external evidence of bleeding. Blood pressure was 130/70, pulse 120, and respirations 20. Urine was negative. A hæmogram showed red blood count 1,910,000, white blood count 14,100, and hæmoglobin 30%, suggesting a subacute post-hæmorrhagic anaemia. Rectal examination revealed tarry stools, but the remaining general examination was negative. On further questioning the patient admitted having noted black-coloured stools two days previously, but had not reported it to anyone. He had had no medication other than penicillin. He was immediately given a transfusion of 1,000 c.c. of blood. This was repeated the following two days, and he was placed on a progressive Sippy diet. Three days later, his hæmoglobin returned to 82% and red blood count to 4,300,000. Tarry stools continued for some time and it was 8 days before they were negative for occult blood.

On discharge on March 11, hæmoglobin was 91% and stools were negative for occult blood. He had no complaints and felt quite well. X-ray examination of stomach and duodenum, two days prior to his discharge from hospital, was negative for gastric or duodenal ulcer.

There was no previous history to suggest the presence of an ulcer. However, the following facts were elicited. He stated that at age 14, he had had several attacks of lower abdominal pain lasting a few days and not related to meals. This episode had occurred during a period of mental stress while studying for examinations. Two years later, he had a similar episode of lower abdominal pain also associated with preparation for examinations. The pain lasted almost a week and x-ray examination of stomach and duodenum at this time was completely negative. Several months after discharge from hospital, a further x-ray study of his stomach and duodenum revealed no evidence of ulcer. Up to the present time, 18 months following his accident, the patient has had no complaints referable to the gastro-intestinal tract. His fracture healed completely and he returned to his work 4 months after his injury.

\* From the Orthopaedic Service, Jewish General Hospital, Montreal.

## DISCUSSION

The case herein described bears a marked similarity in every respect to the 4 cases described by Wangenstein.<sup>1</sup> In these cases, hæmatemesis and melaena occurred from a few days to over one month after the fractures were sustained. In the authors' case, the onset of hæmorrhage with melaena was 5 days following the open reduction, or 21 days after the fracture occurred. From the history it appears most likely that there was some bleeding over a period of several days with probably a massive hæmorrhage, as the change in the patient's condition was a sudden one, occurring practically overnight.

In a series of animal experiments Wangenstein *et al.*<sup>2, 3, 4</sup> were able to produce acute gastric or duodenal lesions which they believed resulted from the occlusion of the gastric or duodenal end-vessels by fat emboli. They observed histologically that the rate of disappearance of the fat from the mucosal and submucosal vessels was rapid; after four days very little remained. This may have accounted for the extremely small incidence of this complication in man.<sup>4</sup>

Although the evidence submitted by Wangenstein *et al.* suggests fat embolism as the possible mechanism for this unusual complication, the facts are by no means conclusive. Acute gastric or duodenal lesions are not uncommonly found at autopsy in patients who died following operations or trauma associated with shock-like conditions.<sup>5, 6</sup> The alterations in the vasomotor tone of the blood vessels in the stomach or duodenum which are known to accompany early shock, if severe or prolonged sufficiently, may lead to local ischæmia, increased capillary permeability and finally to necrosis of the mucosa.

However, it may also be possible that the occurrence of mucosal hæmorrhage or erosions or ulcers in the stomach or duodenum is more frequent than has been clinically recognized thus far. If the mucosal lesions be associated with only a minimal amount of bleeding, it would be extremely difficult to recognize clinically, unless routine examinations for occult blood in the stools were made on all fracture cases. Such a view is supported by the evidence that ulcers or erosions have been found in post-mortem examination of patients dying shortly

after fracture, in whom the condition was not suspected clinically.<sup>1</sup>

Although this complication associated with fractures appears to be extremely rare, it is well to remember the possibility of its occurrence and its implications.

## SUMMARY

A case of compound fracture of lower end of tibia and fibula complicated by massive gastro-intestinal hæmorrhage is presented and possible etiological mechanisms are discussed.

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## SOLITARY CYST OF THE KIDNEY WITH HYPERTENSION\*

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In the present-day urological literature there is evidence of active interest in the subject of renal disease and an associated hypertension. A review of the published articles dealing with this phase of urological investigation seems to indicate that the majority of cases showing an improvement in hypertension following renal surgery are: (1) adult chronic pyelonephritis; (2) unilateral hydronephrosis; and (3) calculous pyonephrosis. It is significant, however, to note that in the large series reported by Ratliff<sup>1</sup> there was no improvement in 26 cases, so far as the hypertension was concerned, out of a total of 49 cases which had been nephrectomized. The remaining 23 showed either improvement or a good result.

It is not my purpose to discuss in detail the various theories advanced to explain the relationship between the involved kidney and the associated hypertension. Most writers seem to accept the experimental findings of Goldblatt as a reasonable explanation of the production of hypertension, which in brief is that of a change of a pulsatile blood flow into a continuous one

\* Read before the Section of Urology, Canadian Medical Association Meeting, Toronto, June 24, 1948.



throughout the entire kidney substance, eventually leading to an arteriolar sclerosis and renal ischaemia. Freedman<sup>2</sup> reports that arteriolar sclerosis was present in 82% of the kidneys removed from patients who had hypertension at the time of operation. Nesbit and Ratliff,<sup>3</sup> however, make the observation that vascular changes (sclerosis) may be observed in an infected kidney without any associated hypertension.

The factor of duration of hypertension is considered important by many of the present day writers on this subject. A good result is expected where renal surgery has been the method of treatment if the hypertension has been known to exist for only a short period of time. In the case being reported now, the hypertension was observed on examination two years prior to the time nephrectomy was performed.

A solitary cyst of the kidney has seldom been cited as a causative factor of hypertension. Kreutzmann,<sup>4</sup> in 1946 reported two cases of solitary cyst of the kidney with hypertension. In both cases the cyst was resected, with improvement in one, but the resection of the cyst failed to improve the hypertension in the second case. This failure he attributed to the long duration of the hypertension.

The patient was a young returned service man of 26 years of age. His sole complaint on admission to hospital was that of persistent frontal headache which had lasted for six months. There were no complaints referable to the urinary tract. At the time of his discharge from the armed forces in January, 1945, hypertension was noted. During active service in the European theatre he had been wounded in the right arm, with fracture of the humerus, and nerve injury requiring suture. The functional result following repair of these wounds has been excellent. He had the ordinary childhood diseases. His father died of asthma, and his mother died of "a stroke".

No abnormalities were noted on the general physical examination, except the hypertension and the presence of a scar on the right arm. Examination of the central nervous system showed no apparent abnormality. The blood pressure readings after a period of bed rest were: left arm 190/126; right arm 180/116. Various urinalyses showed a trace of albumen and occasional red and white blood cells on microscopic examination. Blood cholesterol 120. Mosenthal test showed normal readings. Haemoglobin 13.8 gm. (100%). Red blood cell count 5,050,000. White blood cell count 8,200. Non-protein nitrogen 27.2. The electrocardiogram readings were normal. Kahn, negative.

The internist in charge of this case (Dr. Adrian Yaffe) requested consultation with the genito-urinary department, to determine the presence or absence of chromaffin tissue in the kidneys, or some other causative factor to explain the hypertension.

Intravenous pyelograms disclosed a right kidney somewhat larger than normal, with a rounded mass occupying the upper and middle thirds of the kidney. There was a displacement of the calyces toward the median border of the kidney. The outer margin of the mass in the

kidney was definitely outlined by a shadow of calcium density. The left kidney pelvis and outline appeared to be within the range of normal. A diagnosis of renal tumour was made (Fig. 1).

On January 18, 1947, a right-sided nephrectomy was performed. The kidney was three times larger than normal. It was tense, lobulated and presented a marked congestion on gross appearance. The pedicle was short but easily ligated, and there was no appreciable drop in blood pressure when this was done. Healing of the surgical wound was complete in ten days. During convalescence the blood pressure readings showed variations between 155/100 and 130/82. One month following nephrectomy and after a full day of activity this patient showed a blood pressure reading of 140/100.

The report of the pathologist (Dr. W. J. Deadman) was as follows:

1. A tumour mass, which proved to be a cyst, with a thick fibrous wall, and in the wall areas of hyalinization, cartilage formation, and new bone formation (Fig. 2).

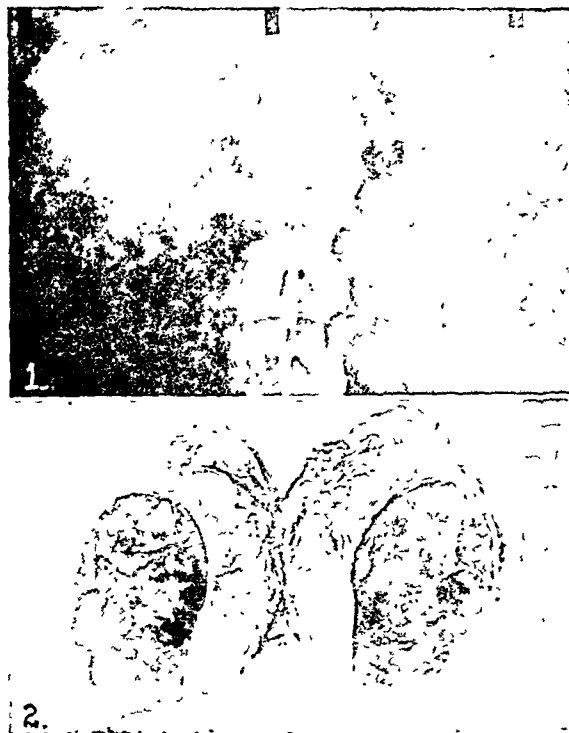


Fig. 1.—Intravenous pyelogram showing cyst of the right kidney, and medial displacement of kidney pelvis. Fig. 2.—Right kidney on section showing area of cyst.

2. Oedema and congestion of the glomeruli.
3. Albuminous degeneration and oedema of the convoluted tubules.
4. There is no evidence of arteriolar sclerosis or malignant change in the sections.

#### SUMMARY

1. A case of solitary cyst of the kidney with an associated hypertension is presented.
2. The known duration of hypertension in this case is two years prior to the surgical procedure.
3. A gradual improvement in hypertension was noted during a sixteen month period of observation following nephrectomy. The last blood pressure reading was 128/88.



4. The persistent frontal headache complained of prior to nephrectomy has been relieved.

5. Arteriolar sclerosis was not seen in microscopic sections of the kidney specimen.

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### ABDOMINAL PREGNANCY FOLLOWING RUPTURE OF CÆSAREAN SCAR\*

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Among the cases of abdominal pregnancy in the literature relatively few have been secondary to rupture of a previous Cæsarean scar. The following case history presents this as well as several other unusual and interesting features.

Z.S.H., a married woman of 25, was first admitted to the American University of Beirut Hospital on March 14, 1947, because of failure to deliver 11 months after the onset of her pregnancy.

An illegitimate pregnancy had been terminated in the 7th month by Cæsarean section two years previously. The convalescence was uneventful. Following this delivery the patient menstruated regularly for 13 months.

Amenorrhœa, accompanied by typical signs and symptoms of normal pregnancy, began 11 months before admission. The patient recalls no episode of bleeding or abdominal pain until the onset of what she interpreted as normal labour 2 months before admission. "Labour" began with recurrent colicky lower abdominal pains,

which came at intervals of approximately 5 minutes. A midwife was called in. After 3 days of unremitting pains, during which there was neither show nor vaginal bleeding, fetal movements ceased. The midwife who examined her vaginally at intervals assured her each time that she would deliver soon. After one week of attendance, and 4 days after fetal movements had ceased, the midwife gave up and told the patient that there was no baby. Abdominal pain, severe enough to confine her to bed, persisted for 5 more weeks. Thereafter she was fairly comfortable.

Vaginal bleeding began 2 weeks after cessation of fetal movements and persisted for 2 months. It was this bleeding, rather than the abdominal pain, which caused her to seek medical advice.

On admission the significant physical findings were elicited by abdominal and pelvic examinations. An irregular firm tumour filled the lower abdomen and extended 3 fingers above the umbilicus. Fetal poles were not identified and a fetal heart was not heard. Pelvic examination revealed a small soft cervix. The uterine body could not be made out and the abdominal mass was palpable only with abdominal counterpressure. X-ray of the abdomen revealed a dead fetus lying transversely with the head in the left iliac fossa (Fig. 1). The Friedman test was negative.

The vaginal bleeding ceased upon admission to the hospital. Since this, rather than the large abdominal tumour, was the patient's principal concern she refused laparotomy and was discharged on March 19, 1947.

We lost trace of the patient until about a year later (March 5, 1948) when she was readmitted. The interval history was as follows: for the first 8 months after her discharge from the hospital menstruation had been regular and normal. Subsequently, vaginal bleeding and vaginal discharge began. These persisted for 4 months and were the immediate cause of her readmission. They were accompanied by slight chills and fever as well as some general malaise, headache and abdominal pain. It was the patient's impression that the abdominal tumour had become slightly smaller.

Re-examination of the abdomen revealed no significant change in the size of the tumour. However, a globular crepitant mass was palpable in the left lower quadrant. The tumour gave the impression of being directly under the skin. Pelvic examination revealed the small cervix retracted high under the symphysis. The body of the uterus could not be made out. Blood examination revealed a mild secondary anaemia and no leukocytosis. The urine contained one plus albumin.

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Abdominal roentgenogram (Fig. 2) showed increased overlapping of the cranial bones. Other than this there was little change as compared with the one taken a year previously. A preoperative diagnosis of abdominal pregnancy was made. In view of the history of previous Caesarean section the likelihood of its being secondary to rupture of the Caesarean scar was considered.

Laparotomy was performed under ether anaesthesia. On opening the peritoneal cavity the fetus was found covered by a thick fibrous capsule. The parietal peritoneum, bowel and omentum were densely adherent to the capsule. After tedious dissection and ligation of the adhesions, the mass was delivered from the abdomen and removed, revealing its former attachment to a gaping classical Caesarean scar. The uterus was of normal size and the tubes and ovaries were not remarkable. Secondary closure of the Caesarean scar was impracticable because of the friability of the uterine muscle. Supravaginal hysterectomy was performed and the abdomen closed in layers without drainage. The patient was transfused postoperatively.

When the removed fibrous sac containing the fetus was opened it was found to contain the softened skull and skeleton surrounded by an amorphous mass of tissue, in which the organs were not to be distinguished. There were no remnants of the placenta. Pathological examination of the uterus revealed a defect 5 cm. long on its anterior surface. Histologic examination revealed an interval phase endometrium with diffuse infiltration of the myometrium by lymphocytes, polymorphonuclears and eosinophils.

Convalescence was uneventful and the patient was discharged on the 11th postoperative day. At follow-up examination 7 weeks after her operation the patient was in excellent health.

#### DISCUSSION

The relatively slight discomfort that the patient experienced because of the abdominal mass is of interest; it was so slight that she refused to be operated upon for a year, until abnormal bleeding recurred and persisted. It is also unusual to have normal and regular periods with an abdominal pregnancy. In this case the patient menstruated regularly for 8 months. Although we cannot be certain as to the time of the rupture of the Caesarean scar it probably occurred during labour. The absence of dramatic symptoms of shock or haemorrhage at the time of rupture is of interest too.

One problem to be considered in the management of abdominal pregnancy is the placenta, particularly when it is attached to vital structures. The trend at present is to leave the placenta, when not infected, *in situ*, and close without drainage. Spontaneous resorption of the placenta obviates this problem when operation is performed long after fetal death, as illustrated in this case. This suggests that in those cases in which the diagnosis is not made until after fetal death and unless there are signs of haemorrhage, shock or distress which would dictate immediate operation, it would be well to

wait some 2 or 3 months to give a chance for the placenta to resorb.

The author wishes to express sincere appreciation for helpful suggestions in the writing up of this report to Dr. Harold M. Teel, Professor of Obstetrics and Gynaecology, American University of Beirut.

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## CLINICAL and LABORATORY NOTES

### THE CARE OF THE PERMANENT COLOSTOMY

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Comparatively speaking, it is only a few years ago since the permanent colostomy was considered one of the most abhorrent results of radical surgery with which human beings could be afflicted. Patients after leaving the hospital, expected to live the life of a recluse, wearing an evil-smelling rubber bag into which the contents of the colon dripped throughout the day and during the night. Many patterns of rubber bags were manufactured with different gadgets supposed to make them air-tight and odour-free, but none were successful. Everywhere the patient went the faecal odour could be detected and he was ostracized socially.

Within the past decade the handling of the colostomy has been entirely changed, and the patient is promised no inconvenience and no unpleasant odour if he takes a few minutes every day or two to irrigate the colon. To facilitate the irrigation routine several apparatuses have been designed and all with slight differences in their appearance but all having the same idea in view, that is, the satisfactory emptying of the colon contents completely every 24 hours, thus leaving the patient entirely free of worry regarding a "spill".

It is surprising to me to hear surgeons criticizing what they call "expensive and complicated gadgets when a catheter and basin are equally successful". One prominent surgeon advises this technique, followed by the application of a small inexpensive plastic cup over the colostomy. There are very few colostomies that can be crowded into one of these little cups and they seem to me to be very inconvenient.

A few years ago I designed a simple irrigator which hundreds of patients in Canada are using successfully and have been for from two to ten years. This is perhaps no better and has few advantages over other irrigators except that in my hands it has always been successful if the instructions are carefully followed. The patient sits on the toilet, with the irrigator held over the colostomy by a belt with catheter inserted

and usually in not more than three-quarters of an hour is able to completely empty the colon, with little if any soiling of either himself or the toilet seat. It is a comfortable procedure and some patients are able to read the morning paper during the irrigation. This certainly is not true where they are sent home after a successful resection with few instructions except to irrigate the colostomy daily with a catheter and kidney basin. After the irrigation the patient may either wear a cap over the colostomy or simply a small vaselined pad covered with a square of koroseal held in place by a girdle or belt.

Sometimes there may be some unpleasantness due to flatus being expelled. Many of my patients have been relieved by taking a capsule containing charcoal and betanaphthol.

#### SUMMARY

It seems a pity that patients with colostomies are being sent back to mix with their friends with few instructions and even with the advice that it is foolish to invest in any expensive irrigating gadgets. The small expense of these is certainly neutralized many times over, by the freedom from worry following a 24-hour or in many cases a 48-hour irrigation, taking only, at the most, 45 minutes.

#### A CANCER DIAGNOSTIC SERVICE FOR THE PRACTISING PHYSICIAN USING THE METHODS OF PAPANICOLAOU AND OTHERS\*

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An examination of the cytological picture presented in sputa and bronchial aspirates in cases of possible bronchogenic carcinoma has for some time constituted part of the routine investigative procedure in these laboratories.

In order that closer familiarity with the field of exfoliative cytology might be made, studies were extended to include secretions from the female genito-urinary tract in normal cases and in cases in which pre-existing carcinoma had already been confirmed. For access to these latter cases, a debt of gratitude is owing to Dr. Walkey of the Hamilton General Hospital.

The criteria of malignancy adopted were the nuclear and cytoplasmic changes long known to pathologists and outlined by Dr. Papanicolaou and co-workers<sup>1</sup> in this already well-established field.

In the course of this study it became apparent that with a little additional effort it would be possible to ascertain the practicality of establishing a service for the general practitioner, both from the point of view of technical excellence of specimens received and the degree of co-operation with which such a service would be met.

Standard kits, containing all necessary equipment including fixing solution and expendable plastic pipettes\* were delivered to the interested physicians. The personal contact was taken as an opportunity of explaining in detail the technique and significance of the tests employed. The problem of transporting smears was obviated by the development of a mailing service run as an additional expense by the laboratory and of a nature similar to the Public Health Service for Wassermann specimens.

The service was offered to physicians in the city of Hamilton and immediate district.

The following is an analysis of the work performed from September, 1947 to June, 1948, inclusive, after which time the service was continued by another laboratory.

#### A. PHYSICIANS PARTICIPATING

Practitioners contacted .....	215
Practitioners signifying intention of using the service .....	115
Practitioners actually submitting specimens .....	65

#### B. MATERIAL SUBMITTED

Total number of patients studied (Usually one specimen per patient) .....	529
Number of specimens technically unsuited for reading .....	7

#### C. RESULTS

##### *Cases reported negative.*

(a) Confirmed negative 3-13 months later (most were gynaecological specimens) .....	451
(b) No follow-up (most were gynaecological specimens) .....	38
(c) Subsequently proved to have malignancy (all were gynaecological cases) .....	6
Total	495

##### *Cases reported suspicious or positive.*

(a) Confirmed pathologically:	
Gynaecological .....	20
Urine .....	1
Pleural fluid .....	2
Ascitic fluid .....	1
	24
(b) Confirmed clinically:	
Gynaecological .....	2
(c) Discredited:	
Gynaecological .....	1
Total	27

#### D. COST OF OPERATION OF THE SERVICE

Approximately \$5.00 per specimen.

\* From the Laboratories of the Hamilton Health Association, Hamilton, Ontario.

\* Manufactured by Irvington Varnish & Insulator Co., of Canada (Irvolite 9055).

### DISCUSSION

The results corroborate the accepted fact that the test is in error on both the positive and negative sides in a small percentage of instances, particularly when only a single specimen is submitted. There is little harm however, in the few false positive reports. They only lead to a more thorough investigation. The question is really whether or not a false negative report, occurring once in a little less than a hundred times makes the use of the procedure undesirable.

The first thing to consider is the fear voiced by some authorities that the doctor who receives a single negative report will tell his patient that she is not suffering from cancer. The man who, having had the procedure explained to him, would act in this way is the same physician, no doubt, who would tell the patient that she did not have cancer, without any test having been done at all, in fact probably without even careful inspection. The great majority of the practising medical profession would unquestionably complete the study of their cases regardless of single negative laboratory reports.

The second thing to point out is that many laboratory tests presently held in very high esteem give an equivalent or even higher proportion of negative results in the presence of disease. For example, it is common to get negative cultures on single attempts from patients with minimal tuberculosis. This appears to have been completely overlooked by some pathologists in their assessment of the value of the smear technique for detecting cancer.

The cost of the cancer test has been said to be prohibitive. This is no doubt true for screening tests on a healthy population. But, it is not likely true for its use as a supplement to a physician's regular examination of a patient coming for medical advice because of some symptom or other. In our series, about one positive test occurred for every twenty tests sent in. It is true that the number of cancers detected solely as a result of the test was much smaller. But even so, one of us, in the operation of a private practice, sent over one thousand Kahn tests on consecutive prenatal patients to the Public Health Laboratories without receiving a single positive report: so that the proportion of positive to negative tests is not an accepted criterion of the economic soundness of establishing a service for physicians. Moreover, a negative test which confirms other findings cannot be considered valueless.

Perhaps the point of greatest importance is that the availability of the cancer smear test encourages the busy physician to examine his patient. The fact that he actually has something that he can do which may help to eluci-

date the patient's condition, and the fact that he knows the patient is aware of this and in favour of the procedure being carried out, leads to an inspection of the cervix which in many cases might otherwise never be conducted. This in itself will undoubtedly lead to early detection of carcinoma and other diseases.

One other point. The importance of biopsy tests in the final examination of a suspected cancer patient is unquestioned. It probably always should be the final word. It usually can equal or better a Papanicolaou smear. But, a busy physician, particularly a country physician, probably won't do a biopsy. He *will* take a smear.

### SUMMARY AND CONCLUSIONS

Results of the operation of a cancer smear service for practising physicians for ten months in a medium-sized city and its environment were felt to justify the following conclusions:

1. It is practicable to set up a cancer smear service with technically satisfactory operation.
2. The service will be used.
3. The service will be of value.
4. The maintenance cost is about \$5.00 per patient per examination.

The authors wish to take this opportunity of thanking the several Hamilton and district physicians who took part in this study for their keen co-operation. In particular they are grateful to Dr. R. T. Weaver for valuable suggestions and criticism.

The study was made possible by a grant from the Ontario Cancer Treatment and Research Foundation.

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CARCINOMA OF THE LARGE INTESTINE: A REVIEW OF PERSONAL EXPERIENCE IN PRIVATE PRACTICE. Wilensky, A. O., *Rev. Gastroenterol.*, 15: 55, 1948.

Advances in the treatment of cancer of the large intestine have been marked and have been accompanied with greater success in the permanent cure of malignancy. This is based on the following factors. (1) Ability to make the diagnosis at an early stage. (2) More efficient preparation of the patient for large scale operations. (3) More efficient technical ability in performance of operations. (4) Better postoperative care. (5) A more wide-spread knowledge on the part of public of coming for check-up observations. (6) Radiation therapy after operation.

too prosperous settlers. At the same time he did not discount the undeniable needs of the colony, but advanced the suggestion that some great personage might generously furnish the necessary funds to build an appropriate institution necessary to house the nuns on their arrival in the country. Marie-Madeleine enlisted the interest of her uncle, who in his turn met Father Lejeune, the Superior-General, when it was decided to found the Hôtel-Dieu de Quebec. The Duchess and the Cardinal jointly granted to the new foundation a revenue of 1,500 livres from a capital of 20,000, to which Her Grace shortly added 24,000 and then 18,000 livres.

On August 16, 1637, the contract was signed with the Religious Hospitalières of Dieppe: the Company of New France, which then administered the colony, making a grant of land within the city walls of Quebec and in 1638, six workmen left France to clear the ground and set up a suitable building.

On May 4, 1639, three Religious hospitalières took ship at Dieppe for Quebec: three Ursuline nuns accompanied them, the latter coming to start a convent for the education of young French and Indian girls. On July 15, they landed at Tadoussac to continue their journey to Quebec in a fishing boat. They passed the night of the 31st at the Island of Orleans and on August 1, they were in Quebec where they were received by all the members of the colony headed by the Governor, the Chevalier de Montmagny.

The building that had to be put up by the six workmen sent the year previously was not far advanced and was certainly uninhabitable, the clearing of the ground had not progressed and the poor shack appeared lost in the heart of the woods. At this time Cape Diamond was completely enveloped in a thick and luxuriant vegetation. A great forest extended from here up to the Laurentides. To settle down the colonists had to clear the forest first, then work the ground progressively and with great difficulty, workers as well as money being scarce, and the Iroquois continuously haunting the place.

The nuns were first lodged in the house of the "Company of a Hundred Associates" on the site now occupied by the Anglican Cathedral, and there was born the Hôtel-Dieu of Quebec which was dedicated to the care of sick Indians: beds were set up and the most urgent cases were admitted. The Indians crowded in, as at that time an epidemic of small-pox was rampant amongst them. Very soon the house was overcrowded and birch-bark cabins had to be set up to shelter the overflow of the stricken.

The poor Indians who for the first time were experiencing the ravages of small-pox, which was to mow them down faster than firearms or

the ways of civilization, died like flies. Horrified, the survivors abandoned this "Death House" to soon discover that they died just as fast and even faster in their forests; 180 patients were treated that winter.

An Indian settlement existed at this time in Sillery, about six miles from Quebec: Montagnais and Algonquins had assembled here under the protection of the Jesuit missionaries. Since the hospital that was to be established at Quebec had for its mission the care of the Indians and not of the whites, it was decided to build it at that place.

In 1640, a Mr. de Puiseaux placed his house at the disposal of the nuns, a narrow one-storey habitation divided in three parts, one of which was dedicated to the care of the sick. In the autumn, however, the new hospital, though not actually completed until the spring, opened its doors; it was a two-storey structure, 100 feet long by 30 feet wide, and it cost 8,000 livres.

But this location was fraught with danger; the Iroquois had vowed to exterminate the colony; they set themselves in ambush on both sides of the St. Lawrence and watched the enemy canoes that ran between Quebec and Montreal. It was dangerous to venture into the neighbouring woods and one could not even go to Quebec without being well escorted. Many French and Indians were overtaken and massacred. These forays became more serious from day to day and crept closer home. The Indians of Sillery deserted their village, to place themselves under the protection of the guns of Fort St-Louis and a guard of from six to eight men watched the little hospital day and night.

At length, as the colony was too weak to divide its forces, the Governor suggested to the hospitalières to leave Sillery and come to Quebec which they did on May 29, 1644; they were lodged in an abandoned house in lower-town. The building project initiated in 1638, was energetically pushed forward and at length in the summer of 1644, the Hôtel-Dieu came into being on the site which it has since occupied.

The first building was duly completed in 1646, although a hospital organization functioned from the very start; the French were taken care of in a house specially rented for this purpose in the immediate neighbourhood and the Indians in huts set up on the clearing around the hospital.

One can imagine the primitive facilities that prevailed: the main building was devoid of floor boards, the huts outside nearly buried in the winter snows and poorly heated; water was drawn from a stream, quite a distance away near the St. Charles River, and it was only in 1646 that the building proper was completed and able to receive patients in the one and

only ward, with beds so closely packed that curtains had to separate them.

Soon the lack of space became more acute, and in 1654, it was decided to expand; the work was completed in 1658. This comprised a chapel and a much larger hospital ward; and considering the times and the state of the colony, the establishment was nearly luxurious. Her Grace of Aiguillon who had adopted the Hôtel-Dieu as her life's work covered the outlay by funds, contributed by herself as well as her many friends in the French Court.

The hospital now opened its doors to French as well as Indians, Hurons, Algonquins, Micmacs and Iroquois. These Indians had a very elementary notion of hygiene and the terrible atmosphere that enveloped them was as disagreeable as it was persistent. This condition was not mitigated by their custom of rubbing themselves with various concoctions as well as by the untanned skins that covered them, a state of affairs which was extremely disconcerting to the poor nuns and the white patients.

Louis XIV who ascended the throne of France in 1643, assumed fully the reins of power in 1651. Under the regimen of this great king, New France took on a new spirit of life; in 1648, her population did not exceed 250 inhabitants, but Louis XIV took the colony formerly exploited by private enterprise under his own wing.

In 1665, three men of great standing arrived in Canada: Mr. de Courcelles, to replace the vacillating Mr. de Mezy as Governor, the Marquis de Tracy as Viceroy and Mr. de Talon as Intendant, with them emigration became active and intense and the colony flourished. These Government officials had a great regard for the hospital; with them arrived a complete regiment, the Carignan-Salières whose history has been so admirably written by Lieut.-Col. Caldwell, Officer-Commanding the Royal Canadian Dragoons.

On debarking at Quebec 130 soldiers were taken to hospital with typhus. Messrs. de Tracy and Talon daily visited them and acquired an added interest in the hospital to which a new wing had just been added comprising a double hospital ward, while a water system was installed which brought water from the stream to the hospital by means of a series of lead pipes: one of these pipes laid across the length of the chimney supplied the house with warm water, a luxury in those days. A laundry was also installed in the cellar. All these improvements produced a very well organized hospital and somewhat compensated for the misery heretofore.

In 1666, the Iroquois menace which had never stopped haunting the little colony finally disappeared and for a few years there was a breathing spell.

The siege of Phipps in 1690, though short-lived, lasted long enough to cause considerable damage to the hospital as well as to other

buildings; cannon balls were then made either of wrought or cast iron; these caused damage by their sheer weight: they landed here and there and were returned with meticulous care: twenty-six so picked up were returned to the besiegers.

Consequent on the increase of the population, greater and more varied needs began to make themselves felt; several invalids, aged homeless and mentally deranged, filled the wards of the hospital to the exclusion of the sick. The Bishop of Quebec, Mgr. de St-Valier, conceived the happy idea of founding a home for the invalids, a "refuge", and in 1692, the religious of the Hôtel-Dieu detailed four of their members to take charge of the first "General Hospital", as that institution was and is still called to this day, where its charitable functions of refuge for the homeless and the aged have been perpetuated. This institution served during the first year of the British occupation as a general hospital while the Hôtel-Dieu housed the soldiers of the British Garrison.

In 1698, thanks to the efforts of Mr. Talon and Tracy the population was augmented to nearly 15,000 souls: Montreal and Three Rivers expanding to the point of requiring and acquiring their own hospitals. But Quebec still remained the most important city and the port where the King's ships dropped anchor with their troops, their emigrants, their sick and their epidemics.

Small-pox was prevalent among the Indians in epidemic proportions, ships brought typhus, small-pox and malignant fever. The Hôtel-Dieu was swamped, one epidemic overlapped the other. Nuns were stricken and died, doctors, even the great Sarrazin died of the contagion. The hospital prospered notwithstanding: improvements were continuously effected, it was also the recipient of a number of bequests, particularly of land in the immediate vicinity and of a very fertile island (Goose Island) which was a source of supply up to the time of the siege of Quebec.

On June 7, 1755, an outbreak of fire razed to the ground what had taken them so much labour and trouble to erect and improve: it was a fatal loss, only the walls of the monastery remained standing: gaunt specters haunting the desolation. A nun perished in the fire and priceless records housed in wooden boxes became prey to the flames. The religious hospitalières took refuge at the Ursulines, the latter returning the same hospitality they had received a century previous, that is in 1650, when fire had ravaged their convent.

They then moved to the Jesuit College and continued their ministration to the sick. It was then decided to rebuild without delay, but it was only towards the middle of 1757 that they could

take possession of their new home. The Bishop ordained that a collection be taken up everywhere and thus fathered 1,300 crowns, the Governor the Marquis of Vaudreuil added 500 livres from his private purse; the country people brought wood and other material, 12 masons were set to work at the expense of the Governor and the nuns themselves did the rest of the work with their own hands, trundling wheelbarrows, painting and glazing windows, cleaning up and doing a hundred other chores.

Times were not good in Canada, the Seven Years war had just begun; troops arrived continuously and fighting was taking place on the Great Lakes, on the rivers and on the borders of the two English and French colonies who shared the north and west territory of North America between them; poverty was rampant, bread rationed, profiteers took advantage of the country people and quarrels arose between the civil governors and the army. Then sickness reared its ugly head, even the plague; a ship *The Leopard* had to be burnt to destroy a hotbed of infection which had decimated the troops and the crew. Sick soldiers and sailors crowded the wards of the new structure as soon as the fever-laden ships arrived; 87 patients came in in one day; 97 died in three months, 22 nuns caught the infection and 5 died. This epidemic petered out in March, 1759, followed by an only too short a respite.

On July 12 of the same year, British troops commanded by General Wolfe and camped on the slopes of Levis, started to bombard Quebec: as the British artillery was very active, it was thought prudent to evacuate the Hôtel-Dieu as far as hospitalization was concerned, five nuns bravely staying behind to look after the cloisters. The others went to the General Hospital which was caring for the wounded of both the British and French. Activity at this hospital was intense, about 800 people were therein sheltered.

Every Canadian knows the history of the Battle of the Plains of Abraham; where the two great leaders, Wolfe and Montcalm fell on the field of honour. Posterity gave them a united monument. After the surrender of Quebec in September, 1759, some of the nuns came back to the Hôtel-Dieu, others continued to lend a helping hand to the General Hospital. The bombardment had created considerable havoc: the walls and roof had been hit, and the yard and the garden were ransacked.

On leaving, the British Fleet left 6,000 men behind to garrison Quebec. These required quarters. General Murray who had succeeded Wolfe, requisitioned certain public buildings, notably the Jesuit College, the Convent of the Ursulines and the Hôtel-Dieu. As late as 1784, the Hôtel-Dieu served as barracks. Murray a very humane officer and gentleman, passed severe laws to guard against possible abuses,

but nothing unpleasant happened and the nuns who had obtained permission to keep a few patients had nothing but praise for the conduct of the soldiers.

The financial situation of the hospital was precarious. A little before the surrender of Quebec, the Hôtel-Dieu had been ordered by the last Intendant of France, Bigot, "of unhappy memory" to pay to the Exchequer the sum of 3,389 livres, supposedly for rent received from Crown lands. Murray magnanimously gave them back this sum: still the debt of the institution had increased considerably and in 1762 amounted to 107,185 livres, while creditors clamoured. The poor nuns were at a loss what to do: they sold a great part of their land and got rid of their furniture, baked bread for the Seminary, mended clothes for the ladies of the town, took boarders in their already restricted quarters and had recourse to the charity of the public. Without the heroic constancy of these brave ladies the Hôtel-Dieu would probably be no more or would at least have suffered through a great gap in its continuity.

In 1775, Canada was again at war, the American troops under General Arnold and Montgomery attempting to take Quebec, then defended by that able and upright nobleman Lord Dorchester. In the spring of 1776, the Americans departed leaving behind General Montgomery who had won a soldier's grave at the foot of the Citadel hill itself, where he bravely fell at the head of his troops.

All this time the troops of the garrison were still quartered at the Hôtel-Dieu: at length in 1784, the construction of the ramparts and the Citadel was pushed forward and with it the barracks; the Hôtel-Dieu was then able to resume its activities proper, repairing and mending was effected and on May 1 of that year, patients began to arrive: the 18 beds available, 10 for men and 8 for women, were immediately occupied. Wars were over; ended were the provocations and ambushes of the Iroquois, ended the conflict between France and England, ended the wars of the American Colonies. Peace had come at last; Quebec would never have to undergo another siege, another bombardment. Prosperity returned to the country; English and French sentiment followed the sympathies or antipathies of the different governors or of an occasional crank be he French or English. There existed, however, in the Canadian countryside a feeling of security; the settler could at last till his land without having to encumber himself with his musket, slung on his back or on his shoulder.

The wards at the Hôtel-Dieu were crowded more than ever and patients were refused admittance through lack of space; the problem of homeless children became more acute and the Canadian Parliament took notice. The



Hôtel-Dieu was designated to receive these children. The first child was admitted on May 15, 1801, then for the next ten years they averaged 40 yearly; by 1845, when this charitable work was arranged for elsewhere, the total of these children which had been sheltered was 1,375.

In 1816, it was decided to build again; the institution possessed exactly \$4,800. The Canadian Government which then had its seat at Quebec, voted a grant of \$22,400 which the Legislative Council first disallowed, then approved the following year. A further grant of \$8,536 was made in 1823. These gifts from the state added to contributions from the population brought the total up to \$35,000 and the following year it was possible to add 10 more beds and various other facilities such as a pharmacy and a dispensary for the poor; the hospital then had 30 beds set up in modern freshly decorated surroundings. Two separate departments were then organized: a medical and a surgical composed of a staff of 2 physicians, 2 surgeons and one consultant-physician and one surgeon in addition.

In 1852, Laval University came into being, It was composed of three faculties, one of which was Medicine. This had existed for some years under the auspices of a School of Medicine, the students visiting the wards of the Marine and Emigration Hospital, the building now occupied by the Veterans' Hospital. In 1855, both the Hôtel-Dieu and the Marine and Emigration became hospitals where clinical studies could be followed; the Hôtel-Dieu's teaching in this sphere has been uninterrupted to this day. With the progress of medical science and the increase of population, the hospital expanded and new branches were created. The 30 beds of 1825 became 80 in 1870 and 375 in 1931. A school of nursing religious was inaugurated in 1904 and since then every nursing nun is an officially graduated nursing sister. Today the Hôtel-Dieu which was not spared by the contrary winds that shook the poor colony in the 17th and 18th centuries has become a tree of giant proportions, a complete hospital organization which has had the genius of adapting itself to the exigencies of scientific evolution and where the quality of the work done and instruction given imparted is second to none in the country.

*The hospitalières.*—The work of the hospitalières started with three young ladies of good French families who did not flinch from coming to take care of the Indians (mind you the French word is even less inviting "Sauvages") to a country where everything was lacking. The colonists were few and were wedged between the St. Lawrence river and the forest, both means of approach for the forbidding Iroquois who had sworn to destroy the French and take hold of the white girls.

The example of the devoted three soon bore fruit, as the following year, 1648, three more came to join them and the first Canadian who became a nun was precisely the daughter of Robert Giffard, the hospital doctor himself. After that, recruits came mostly from Canada, France sending but few candidates. This recruiting has never stopped and not once has the hospital been obliged to have recourse to the help of any but its own children for the care of the sick.

These ladies chosen carefully among those that so offer themselves and accepted after serious tests, have always been found equal to whatever task was entrusted to them. They have known how to suffer in the course of duty and never, not even during bombardments and frequent epidemics, have they shown any inclination of deserting their post. Without them, the Hôtel-Dieu would not have had this remarkable continuity. Since 1904, they all acquire a diploma of graduation as nursing sisters. This training school is affiliated to Laval University.

*Doctors.*—The two first to clear and till land in Canada were Louis Hébert, a chemist, and Robert Giffard, a surgeon. It was to the latter that was granted the first seigneurie (Manor) of Beauport; while primarily a colonizer and a clearer of land he did not hesitate to use his medical science for the benefit of the people of Quebec and particularly the patients of the Hôtel-Dieu. His occupations were numerous and at the Hôtel-Dieu he was assisted by a young French surgeon, René Goupil, a man of great integrity who attached himself to the Jesuits in a lay capacity, putting himself body and soul to their service. He was brutally murdered by the Iroquois in 1642 in the Huron country where he used his surgical knowledge gratuitously to do good.

Jean Madry, who succeeded Giffard was also a surgeon and had been commissioned by the King to found a school of surgeons in New France which under his tutelage would practice surgery all over the country. This school was never formed.

Then followed the De Morny, the father, Jean-Baptiste, and the son: Timothée Roussel, who erected his residence, the house still known as the "Golden Dog" facing the upper-town post office in Quebec.

But the most famous under the French regimen were unquestionably Michel Sarrazin de l'Etang and Jean François Gaultier, both learned men and both corresponding members of the French Academy of Science. Sarrazin arrived in Canada as a surgeon but returned to France to study medicine in Paris and Rouen, returning to Canada with the diploma of the latter school. He cared for the sick with ability and devotion. His writings on the "fauna" and the "flora" of Canada are still famous.



He traced the habits of the beaver and the characteristics of the sugar maple tree. He died in 1734 at the age of 75 of malignant fever caught from one of his patients at the Hôtel-Dieu. Sarrazin had studied flora and their healing properties, using several of these plants as decoctions or infusions, *e.g.*, the *Aralia Canadensis* useful in the healing of indolent ulcers, and the *Aster Corona* as an emetic and a purgative. Sarrazin was a surgeon, and he did not hesitate to operate. We find at the Hôtel-Dieu, the description of the removal of a cancerous breast of Mother Barbier, a nun of Montreal. He was famous all over Canada and people came from all parts to be treated by Sarrazin. Jean François Gaultier, who succeeded him at the Hôtel-Dieu was more a man of research and a learned naturalist than a physician.

From 1759 to 1784, the troops quartered at the Hôtel-Dieu were under the care of Drs. Russell and Blair, military physicians, while Dr. Dénéchaud took care of the few patients left and of the nuns. On his death, Dr. Longmore became the physician for the Hôtel-Dieu with whom was associated Dr. Holmes in 1799. With the year 1825, a new era opened in the Hôtel-Dieu. The hospital was renovated and two separate departments, medicine and surgery, were created with two doctors and one consultant for each department. By gradual expansion it has grown to its present commanding position.

That is briefly the epic of the pioneers to whom the Hôtel-Dieu of Quebec and Canada as a whole, are so greatly indebted. The same spirit of 1639 has gone down through the ages to 1948. That spirit which unflinchingly faced danger, and untold obstacles with faith, courage, vision and loyalty has been fittingly crowned.

I wish to express my thanks to the Nuns of Hôtel-Dieu, Dr. Charles Vézina, dean of Laval Medical School, and Lieut.-Col. Vincent A. Curmi, for their great help in reviewing this paper.

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## MEDICAL ECONOMICS

### Medical Services in Great Britain

In September, 1948, we published a short review of the course of events in Great Britain leading up to the present pattern of medical practice. At the time of doing this the preliminary stage of struggle and readjustment had been completed, and the plan which went into effect on July 5, 1948, was in full swing.

It may be of interest to recapitulate the final result of the protracted discussions which had arisen over various points in the scheme as originally put forward by the Government.

1. The restrictive powers of the Medical Practices Committee have been reduced to a minimum. Any doctor may practise where he likes in those areas not specifically defined as being over-doctored.
2. The profession failed to remove the prohibition of the sale and purchase of practices.
3. A legal committee has been appointed to investigate the implications of the Act with regard to partnership agreements.
4. The principle of the "basic salary" has been abandoned by the Minister. It will be applied only in cases where it can be justified and on the recommendation of the Executive Council. Statutory provision will be made in an amending Bill to make it impossible for a whole-time salaried service to be introduced by regulation.
5. The profession failed to gain the right of appeal to the Courts.
6. After the initial appointment local Executive Councils will be enabled to elect their own Chairmen.
7. The Minister has modified his attitude towards the transfer of private nursing homes, and these will now be excluded from transfer.
8. The terms and conditions of service of consultants and specialists are being prepared. The continuance of part-time specialists at hospitals is promised. Private pay-bed accommodation is promised; this will remain where it is at present, but the Minister does not commit himself to its future distribution.
9. No amendment has been made to the constitution of the various administrative bodies.
10. In several ways the power of the Minister has been diminished, though it is still very great. One important concession is that he has undertaken that regulations affecting medical practitioners shall be the subject of consultation with the profession before they are made.

The total effect of these various concessions was to modify very substantially the Minister's

original uncompromising adherence to the rigid structure of the medical service proposed in Socialist party policy. The extracting of a promise of an amending Bill of considerable scope after the blank refusal received only a few months earlier was itself a great achievement, for this opens the way to further improvement and flexibility. The Bill will probably be introduced into Parliament in the autumn of 1948, when it will be carefully examined by the profession.

It is interesting to turn for a moment to the "General Medical Service for the Nation" of 1938 to see what has happened to the broad principles there enunciated. The National Health Service Act of 1948 provides a complete health service for every member of the community, though not in the way the profession had in mind. A co-ordinated hospital system in regional organization has been secured. But the integration of all medical services in a single national health policy has not yet been achieved, for the National Health Service Act does not include such an important aspect of medical service as industrial medicine. Moreover there is still insufficient liaison between the different branches of medical provision and practice, and several Government Departments are still administering their separate medical services.

#### THE FUTURE

So, after the turmoil, the medical profession as a body has decided to co-operate in working the National Health Service Act. It is too early yet to say what proportion of individual doctors will enter the service, and how many will continue in independent private practice, or what proportion of the public will seek private medical service instead of availing itself of its rights to medical benefit.

No magic wand was waved on July 5. The Act did not create a single extra doctor or nurse or hospital bed or building or piece of equipment. The supply of all these remains inadequate, and it is clear that patients will not be able to enjoy for a long time to come the "comprehensive" service promised by the Act. Further, many matters affecting medical practitioners have not yet been completely settled, for example, the amount of remuneration, the terms of service for consultants and specialists, and details of compensation for the loss of the capital value of general practices. Much labour still awaits the representatives of the profession, and they will have to exercise the utmost vigilance to ensure that the service develops in accordance with the needs of the public and the ideals of medicine.

Nevertheless, in spite of some misgivings and apprehension, the profession is entering the service in a good spirit and is determined to do all in its power to make the new scheme a success. Doctors will endeavour to preserve

the humanity of medical practice by treating the patient not as a "vehicle of disease" to which rules and regulations must be applied, but as a personality in need of care and advice.

The following are some additional details on the National Health Services Act of Great Britain, as at present in operation.

A panel cannot exceed 4,000. The average is between 2,200 and 2,400.

Ninety-five per cent of the people come under the scheme.

A general practitioner receives a capitation fee of 17s. 6d. per year. In addition, he is allowed 7 guineas per case for a confinement, and extra fees for vaccination and immunization.

Rural doctors who do their own dispensing are allowed an extra amount for drugs.

Specialists are employed on a salary basis and are graded according to the amount of time devoted to specialist work. The average whole-time specialist will begin at £1,500 a year and rise to £2,500. This group will include two-thirds of the specialists; 20% of the remainder will get up to £3,000 a year; 10% of the remainder will get up to £4,000 a year; 4% of the remainder will get up to £5,000 a year.

A part-time specialist will be paid according to the time he works, plus 25%. *e.g.*, a man working half time gets one-half the specialist's fee plus 25%.

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## MEDICO-LEGAL

### MINOR MEDICO-LEGAL PROBLEMS\*

T. L. Fisher, M.D.

Ottawa, Ont.

The work of the Council of the Canadian Medical Protective Association is not unrealistically serious. Granted that many of the inquiries which reached the Council are matters of moment to the inquirers and that some of them seem matters of urgency, there still are some that, in addition, have an unexpectedly ludicrous aspect. Some of these cases with, where possible, a short comment on the reasons for the advice given form the subject of this discussion.

As the idea underlying the discussion took form a review of the requests for advice was made. It was noted that many of these involved advice to doctors about matters and cases having two things in common. They were of sufficient importance to be worrisome, but did not seem of sufficient gravity to justify court action if the preliminary handling were proper.

\* From the Canadian Medical Protective Association.

Alleged breach of professional confidence perhaps makes up the greatest number of these minor cases. Some were obviously trivial matters that would have been amusing had it not been for the underlying realization that they could become court matters with disagreeable sequelae. They varied from those minor matters to the cases where actually there seemed grounds for feeling that a breach of professional confidence had been made.

One doctor, for example, stated that during the delivery of a patient she had told him her husband was not the father of the child. The doctor then, filling in the birth certificate, was in the unfortunate position of having too much knowledge to write the husband's name and too little to put anyone else's name as the father. He therefore stated the father was unknown and, of course, very promptly, was visited by the husband with some attendant unpleasantness. Another member of the Association would have needed to be a Solomon to solve his problem. At the end of a delivery he was confronted by a man who requested the particulars of the delivery in a manner that implied he was the patient's husband. The information was given in the usual manner. Then a second man turned up a week later who, because he was the husband, felt he had a right to the information.

What should the unfortunate doctor do when confronted by facts which suggest illegitimacy or by requests for information the answers to which undoubtedly will get him into trouble and will probably form the basis for future divorce action? It would seem that doctors must have gained some knowledge or received some hint prior to the time the questions are asked that would suggest he should protect himself by referring all inquiries to the patient herself. There is no reason why a doctor should talk himself into trouble in these circumstances; the patient is the logical one to make such explanations as are necessary.

In something the same category is the case of the doctor who was worried by a demand for information from the mother of an eighteen-year-old, unmarried girl whose pregnancy and delivery he had supervised. The girl being, in the eyes of the law, a minor, should he give the mother the information when she requested it or consider it a matter of confidence between his patient and himself? Consider the same problem with some added complicating factors. A doctor was called to treat, for a septic abortion, a seventeen-year-old female who, ostensibly, was unmarried, but who stated to him that she had been secretly married to a nineteen-year-old man. He, without presenting any evidence other than his simple statement of the fact, confirmed her statement. Not only was the doctor being pressed by the girl's parents for information as to the nature of her illness, but he was being

worried by her requests, even demands, that he arrange his certification of her illness so that she could collect sickness insurance. The difficulty about that arose from the fact that the policy excluded payment for any condition relating to pregnancy. So the doctor was faced with the problem of falsifying his certificate or, in the patient's eyes, denying her the benefits she considered hers from the sickness insurance policy.

Once again there seemed no reason why the doctor should shoulder a load that properly was not his. He was advised that the parents should be referred to the girl for such information as she chose to give them, and that his certificate should be filled in accurately and handed to the girl so that she might decide herself whether she wished to keep the nature of her illness secret or to divulge it in the hope that she might collect the sickness insurance.

Even after patients are dead, confidence must be maintained by the doctor or the estate may have a claim against him. One case illustrating this appears in the Association's files. It was the case of a man who, applying for insurance, neglected to state his correct age or to volunteer the information that he was a diabetic. Some relatively short time later, surgery for a condition apparently unrelated to either his age or his diabetes was necessary and the patient died unexpectedly during the operation. On the grounds that the death was accidental the widow attempted to collect under the double-indemnity accidental clause in the insurance policy. To do this it was necessary that she conceal, and that she demand the doctor conceal, the information that had been withheld by the patient from the insurance company. She visited the doctor and instructed him specifically that he should not divulge the information. At this stage of the problem, without any other knowledge, it would seem that the doctor's only course of action would be to refuse a certificate to the insurance company, referring them to the widow on the grounds that her refusal of permission necessitated his refusal of information. Then the problem would be hers to decide, whether to provide accurate information and collect whatever was due her or to attempt collection under false pretenses. In this case, however, the doctor was smarter than the patient. He remembered that in most insurance policies there is a clause which must be signed by the applicant allowing a doctor to give information to the insurance company and protecting him against any charges of breach of professional confidence arising therefrom. Very properly, he determined first that such a waiver was in the deceased's policy and then provided the insurance company accurate information.

One or two cases have arisen where doctors, during treatment for some unrelated condition, have learned the presence of venereal disease

and reported it to the proper provincial health authorities and then have been threatened with actions for breach of professional confidence when the Departments of Health insisted on treatment for the patient. It must be remembered that such reporting, done in the manner provided by the various provincial statutes, does not constitute a breach of professional confidence and does not need to cause doctors any worry.

When it is remembered how many opportunities could be seized by female patients to charge doctors with immoral conduct, it should be a matter of very great pride to the profession that occasion for such complaints is seldom provided patients. Only two such cases were found in the review of the Association's files. In one a patient, to avoid payment of a three-dollar account claimed the physician's conduct was "unethical" during his examination of an injured knee. Another might easily have been a matter of considerable embarrassment had it been pressed, even making full allowance for the circumstances at the time. The doctor was consulted by a woman who wished pelvic examination to learn whether or not she was pregnant. The examination was done in the doctor's usual examining room, in the presence of his nurse. The examining room was separated by a single door from the waiting room in which, at the time, were twelve persons waiting for the doctor. In spite of all this, the husband, who was judged by the doctor to be mentally unbalanced, charged that the doctor's conduct had been immoral.

Doctors seem not to be immune from charges of having made libellous or slanderous statements. Sometimes the statements, having to do with scientific matters, are not too scientifically proved even if they have the merit of probability; witness the statement of a practitioner to many persons that the cause of their diarrhoea was some pastries bought at a bakery whose owner resented the implication of the statement, to such a degree that he wanted a public apology or a substantial amount of cash. Derogatory comments about everyday matters may be unwise. One doctor, during a discussion in writing of a medical co-operative's refusal to pay what he thought was a legitimate bill, made statements reflecting on the honesty of the co-operative. In both cases the doctors had to be advised that unless they had adequate proof to satisfy a court they would have to make the apologies demanded of them.

How involved these matters having to do with careless talk can become is well shown by the case of a school doctor who felt her reputation had been injured by some remarks made by the parents of the child who had been injured at school. In her demand for an apology from the parents the words "libel" and "slander" were used as well as the word "scurrilous". The parents resumed the offensive promptly by con-

tending that the word "scurrilous" in the context in which it was used, itself constituted libel or slander and threatened to institute action against the doctor. By the time the Association heard about the case not only was there a threat of action for malpractice and negligence against the doctor, but a threat of action for libel by the doctor against the parents, and a counter-threat of the same kind by the parents against the doctor. It rather seemed as though matters were so involved that the whole fight should be called off.

It often is the wisest course of action to ignore disparaging remarks made by dissatisfied patients or disgruntled relatives. The speaker's opinion seldom will be changed by attempting to force him to withdraw the remarks and it is almost impossible to force withdrawal as long as the remarks do not impute dishonesty or do not constitute slander. One doctor reports that during a commission of inquiry into the affairs of a municipal hospital a statement he considered derogatory to him was made by one witness and never contradicted. In such a case it is best to ignore the whole matter. It is rather comforting too, to know and to remember that all one's acquaintances who accept these disparaging remarks at face value have felt that way for a long while anyway and are little influenced by another person saying the same thing, while all one's patients and friends are equally sure they are not true and are equally uninfluenced by the remarks.

Not many doctors will be sued because they punish children, but one was. During an attempt to take blood from a fractious child he became so noisy and troublesome that the doctor spanked him. Apparently the spanking was effective treatment because the doctor was able to obtain the blood with no more trouble. However, the patient's mother objected to the spanking and took the doctor to court. There it was decided that, at least for the short period of time in the doctor's office, the doctor stood *in loco parentis* and that if the spanking was the only method he could use to allow him to get his necessary sample of blood it was permissible.

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Much has been said about patients who demand everything they can get under the new National Health Service in Great Britain. But there is another side to the picture, represented in a letter from a well-known practitioner in a big Yorkshire city. He says that on the whole his patients are understanding and considerate. Their attitude is very well expressed in a remark of one working woman, a typical Leeds housewife: "It doesn't seem right, somehow, doctor, that we should get all this for nothing."—*Brit. M. J.*, November 13, 1948.

ASSOCIATION NOTES

The 80th Annual Meeting: Saskatoon, Sask.

Your Saskatoon hosts for the 1949 Convention wish at this time to extend to you the heartiest of invitations to attend the 80th Annual Meeting which will be held in Saskatoon, June 13 to 17, 1949. Though our city is not as large as some which have previously accommodated this gathering, we feel that we shall be able to find rooms for all who desire to come. We are fortunate in being the home of the University of Saskatchewan, in whose various teaching buildings the scientific sessions will be held. In addition to the accommodation available at the Saskatoon hotels, we have been offered the facilities of the University residences as well as the dormitories of St. Andrew's and Emmanuel theological colleges. These residences are all most convenient to the locations of the scientific sessions.

Accommodation is as follows:  
The Bessborough — single, \$5.50 per day; double, double bed, \$9.00 per day; double, single

beds, \$9.50 per day; three beds in a room, \$3.50 per person per day; four beds in a room, \$3.25 per person per day.

In the following approved hotels: Baldwin, Barry, Empire, King George, Patricia, Queen's, Senator, Western, Yale — single \$2.00 - \$3.00; double \$3.00 - \$5.00 per day.

The University residences consist of rooms with two single beds, towels and linen supplied, no private baths.

St. Andrew's College has rooms with single beds, no towels supplied.

Emmanuel College has single and double rooms, no towels supplied.

Rates in all these residences will be reasonable.

Thus you need not fear that we shall not be able to accommodate you. The city is compact and no matter where you may be staying you will be able to get about easily. Saskatoon and Saskatchewan are at their loveliest in June. Please make your reservations early and plan to enjoy the Convention with us.

APPLICATION FOR HOTEL ACCOMMODATION, C.M.A. MEETING, SASKATOON  
JUNE 13 TO 17, 1949

NOTE: The majority of hotel rooms will have a double bed. The University will have only single beds—two to a room. Please arrange to share a room.

To the Housing Committee,  
Canadian Medical Association, Sask. Division,  
415 Birks Building, Saskatoon, Sask.

Please reserve accommodation for ..... people, attending the 1949 Canadian Medical Association Convention in Saskatoon, Saskatchewan.

Arriving Saskatoon .....  
(expected hour)

Travelling by: (please check) Rail .....; Plane .....; Auto .....

Room will be occupied by (print):

Name	Address	City	Province
.....	.....	.....	.....
.....	.....	.....	.....

Please send confirmation to:

Dr. ....  
.....  
.....

NOTE: You will receive confirmation direct from the Housing Committee.

## THE CAMSI COLUMN

### A BYSTANDER LOOKS AT CAMSI

A. D. Kelly, M.B.

Toronto, Ont.

It was my privilege to act as the delegate from the Canadian Medical Association to the Twelfth Annual Conference of the Canadian Association of Medical Students and Interns, and I wish to record certain impressions of the gathering just concluded (November 18-21) in Toronto.

The Conference opened with a report from each of the ten constituent medical schools. Each of them was represented by two official delegates, and their reports constituted a march past of student activities and aspirations from Dalhousie to Alberta. These young men and women impressed me with their sincerity, their ability and their maturity. I am quite sure that in the dim and distant past when I was a medical student a similar gathering would have been much more juvenile in its outlook. The majority of those present had seen service in the Forces, they are responsible Canadian citizens who know what they want and who are striving democratically to achieve it.

Democratically? I have seldom attended a meeting where the democratic procedures were more scrupulously observed. Mr. Rodger Hines, the President, was meticulous in his impartiality. All points of view were listened to with attention, resolutions were amended and amended again until they represented the composite view of the majority, and, when passed, they were accepted with good grace by all.

We all talk a good deal about the importance of the general practitioner in the medical team and deplore the trend towards early specialism. The members of CAMSI are well aware of this problem and they have through their Summer Employment Project made a positive step towards its solution. Last summer approximately seventy positions were made available for senior students to associate themselves with general practitioners or with small hospitals. Plans for an extension of this service are being made, and it is hoped that many more students will serve a summer apprenticeship under interested and experienced physicians in the field of general practice.

CAMSI is very much interested in plans to arrive at a common method and a uniform date of appointment of final year students to their first positions as interns. In any discussion of internship, one is immediately confronted with the fact that considerable variation exists between the various schools in respect of the time of the award of a medical degree, and the status of the first internship, whether graduate or undergraduate. Here is a matter which justifies the attention of the Association of Canadian Medical Colleges, the provincial licensing authorities, the Royal College of Physicians and Surgeons of Canada, and the Canadian Medical Association. All of these agencies are interested in various aspects of medical education and internship, and should be capable of devising standards more equitable and uniform than those which exist today.

Another project of CAMSI which has met with some success is the campaign to establish the principle that the services of junior interns in teaching hospitals are worthy of a modest cash remuneration. A survey has shown that many students will find it impossible to undertake the postgraduate training they require if they are to be entirely dependent on their own or their family's resources. The Conference was encouraged to realize that they have the support of the medical profession as embodied in the following resolution passed at the 79th Annual Meeting of the Canadian Medical Association:

"That General Council go on record as approving the reasonableness of CAMSI's request that graduate interns at teaching hospitals be paid \$25.00 per month."

The use of medical films for teaching purposes, the encouragement of displays of student painting and photography, financial assistance for undergraduates, the supervision afforded interns in approved hospitals, the procurement of medical journals, the purchase of students' equipment, and many other topics were debated. The value of this Annual Conference in correlating on a national basis the activities of the medical undergraduate societies was amply demonstrated in the wide range of their interests.

The National Executive of CAMSI will for the next year be composed of undergraduates at the University of Western Ontario. Mr. Ian Wilson and Mr. Harold Robinson, the new president and vice-president, were in attendance as delegates and from their contribution to the Conference, it is evident that affairs of CAMSI will be in good hands.

CAMSI now represents the men and women who will shortly be members of the medical profession. They look to the Canadian Medical Association and to the Divisions for sympathetic understanding of their problems and assistance in solving them. Such aid as we can give should not be withheld, for by helping our junior colleagues we will be promoting the unity of our profession.

## MEDICAL SOCIETIES

### Ontario Medical Association District No. 2

District No. 2 of the Ontario Medical Association held their District Medical Meeting at Galt, Ont. on November 2 and 3, 1948. On the first day a business meeting was held in the Club Rooms, Iroquois Hotel. The following day at the Galt Collegiate, a surgical clinic was held by Dr. Kenneth Campbell of Detroit a medical clinic on "Arterial Hypertension" by Dr. S. W. Hoobler, of Detroit and a discussion on "Intestinal Obstruction" by Dr. Alexander Bain, Jr. also of Detroit. At a luncheon at the Iroquois Hotel, the guest speaker was Dr. W. V. Johnston, Lucknow, President Elect of the Ontario Medical Association.

### Academy of Medicine, Toronto and District No. 2

Sir Archibald McIndoe, C.B.E., F.R.C.S. of the Queen Victoria Hospital, Sussex, England, addressed the combined meeting of the Academy of Medicine, Toronto and District No. 11 of the Ontario Medical Association on November 2, 1948. His subject was "Re-constructive Surgery in Facial Burns".

### University of Toronto Faculty of Medicine

The Medical Alumni Association of the University of Toronto Faculty of Medicine held its third annual postgraduate meeting at Sunnybrook Hospital on November 11, 12 and 13, 1948.

### Academy of Medicine, Toronto

A panel discussion on Coronary Heart Disease was held at the Academy of Medicine, Toronto on November 9, 1948. The clinical side was discussed by Dr. John Hepburn and Dr. A. J. Kerwin. The pathological side was discussed by Prof. Wm. Boyd, Toronto and Prof. J. C. Patterson of the University of Western Ontario.

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### Manitoba Medical Association

The annual meeting of the Manitoba Medical Association (Canadian Medical Association, Manitoba Division) was held in the Royal Alexandra Hotel, Winnipeg, October 19, 20, 21. Dr. Wm. Magner, President of the

C.M.A. was present and was a guest speaker. Other guest speakers were Dr. J. A. McKelvey, head of the Department of Obstetrics and Gynaecology, University of Minnesota; Dr. F. G. Elbaugh, Director of Psychiatry, University of Colorado; and Dr. T. C. Rountley, C.M.A. General Secretary. The President of the M.M.A., Dr. Roy W. Richardson, presided at the business meeting and at the colourful annual dinner. The program was well rounded and provided good mental fare for everyone. The scientific exhibit included an interesting collection of coloured photographs illustrating various pathological conditions met with at the Winnipeg General Hospital. Thirty-nine commercial exhibitors provided an interesting display. The membership committee reported 658 members of the Association, 87% of the doctors in the province.

The group insurance committee recommended a plan for group sickness and accident insurance. The treasurer of Manitoba Medical Service, the prepayment scheme sponsored by the Manitoba Medical Association, reported that new premises had been occupied, new office equipment purchased and paid for and that there was a substantial cash reserve. Salary limitations under Manitoba Medical Service were raised to \$2,400 for single persons, \$3,000 for a married couple and \$3,600 for a married couple with children.

Officers for the ensuing year were elected as follows: *President*—Dr. H. S. Evans, Brandon; *First Vice-president*—Dr. D. L. Scott, Winnipeg; *Second Vice-president*—Dr. E. J. Johnson, Selkirk; *Honorary Secretary*—Dr. A. M. Goodwin, Winnipeg; *Honorary Treasurer*—Dr. C. B. Schoemperlen, Winnipeg; *Rural Members of Executive at large*—Dr. A. S. Little, Dauphin and Dr. E. J. Cunningham, Carman; *Winnipeg Member of Executive at large*—Dr. L. A. Sigurdson, Winnipeg.

ROSS MITCHELL

### Canadian Physiological Society

The Twelfth Annual Meeting of this Society was held in Quebec City on October 15 and 16, 1948. The following titles and abstracts have been selected from the 62 papers presented.

- (1) **A Method for Studying the Specificity of Action of Metabolic Inhibitors in Intact Cell.** J. G. Aldous (introduced by C. B. Weld), Department of Pharmacology, Dalhousie University, Halifax.
- (2) **The Glyoxalase Activity of Preserved Human Erythrocytes.** S. A. Alivisatos (by invitation) and O. F. Denstedt, Department of Biochemistry, McGill University.
- (7) **The Haemolytic Factor in the Pathogenesis of the Anæmia of Leukæmia and the Anæmia of Carcinomatosis.** Malcolm Brown, Department of Medicine, Queen's University.

By following the rate of disappearance of transfused erythrocytes evidence has been collected which suggests that an increased rate of hæmolysis is at least partially responsible for the anæmia seen in leukæmia and in cases of carcinomatosis. Some of this increase may be due to a speeding up of the normal hæmolytic mechanisms, but part of it is due to a mechanism not seen in normal persons.

- (8) **The Nutritional Status of the Eskimos. III. Fatty Metamorphosis in the Liver.** Malcolm Brown, R. G. Sinclair, L. B. Cronk, F. deSinner (by invitation), Department of Biochemistry and Medicine, Queen's University.

It is relatively common to find a considerable enlargement of the liver in all age groups. Liver biopsies have shown that the enlargement is due to fatty metamorphosis. There is no associated change in serum bilirubin, plasma proteins, blood lipids and plasma alkaline phosphatase. A high protein, high carbo-

hydrate diet over a period of four weeks was followed by a marked decrease in the liver size whereas treatment with large doses of ascorbic acid and the B complex was not.

- (9) **The Nutritional Status of the Eskimos. I. General and Clinical Findings.** Malcolm Brown, R. G. Sinclair, L. B. Cronk, F. deSinner (by invitation), Departments of Biochemistry and Medicine, Queen's University.

Almost every Eskimo has known what it is to be seriously short of food for brief periods but there is as well evidence that chronic malnutrition exists on a considerable scale. The physical changes are marked in some of the young children and signs suggesting a deficiency of ascorbic acid and riboflavin are the most frequently noted. At all ages it is not common to find fatty metamorphosis of the liver which responds to treatment with a high protein, high carbohydrate diet but not to the administration of vitamin supplements.

- (13) **Variations de l'Acide Ascorbique en Fonction du Poids des Surrénales Après les Brûlures.** A. Des Marais et L. P. Dugal, Département d'Acclimatation, Institut d'Hygiène et de Biologie Humaine, Faculté de Médecine, Université Laval, Québec, Que.

- (15) **The Effect of Hæmorrhage on the Peripheral Circulation in Man.** O. G. Edholm, Department of Physiology, University of Western Ontario.

Venesections varying from 250 to 1,300 c.c. have been performed on sixteen normal subjects. Seven of these fainted. Four to five hours after venesection, the withdrawn blood was retransfused. The object of these experiments has been to determine whether muscle blood vessels constrict as a result of such hæmorrhage and to compare the blood flow after hæmorrhage in fainters and non-fainters. In the nine non-fainters, there was no change in the forearm blood flow in six subjects. In three there was a slight but insignificant decrease. In the seven subjects who fainted, the usual vasodilation occurred during the faint. Subsequently, the forearm blood flow remained at the control level in four subjects and there was a slight decline in three others. When blood was transfused, there was on the average a slight increase in flow in all subjects. After the transfusion was completed, there was a considerable increase in blood flow in twelve subjects; the remainder showing little change.

Complete graphic records of heart rate were obtained throughout the experiments by means of a cardiograph. In cases of fainting, these showed marked and sudden slowing of the heart which occurs at the onset of the faint.

- (18) **Observations Préliminaires sur la Sensibilité de l'Homme au Déficit d'Oxygène Correspondant à une Altitude de 10,000 Pieds.** P. E. Fiset et L. P. Dugal, Département d'Acclimatation, Institut d'Hygiène et de Biologie Humaine, Faculté de Médecine, Université Laval, Québec.

A défaut d'autres critères physiologiques, seule la nécessité d'assurer une bonne vision pour le vol de nuit justifie l'emploi de l'oxygène à des altitudes aussi peu élevées que 10,000 pieds. Quant au vol de jour à la même altitude, il a été impossible jusqu'ici, malgré de nombreuses recherches, de déceler un effet physiologique quelconque dû au manque relatif d'oxygène. Cette impossibilité explique pourquoi nous avons employé des tests psychologiques standards et objectifs pour essayer de mettre en évidence, le jour, la sensibilité des centres supérieurs à une anoxie légère. Les tests employés concernent (1) l'habileté mécanique (avec 7 épreuves différentes); (2) l'habileté à saisir les relations spatiales; (3) l'habileté à évoquer des objets.



20 sujets humains, divisés en deux groupes, recevant par régulateur automatique, l'un de l'O<sub>2</sub>, l'autre de l'air comprimé, furent soumis à une altitude simulée de 10,000 pieds pendant 14 semaines, à raison de deux heures par jour, deux fois la semaine. Les sujets ignoraient à quel groupe ils appartenaient.

Dans tous ces essais, la performance des sujets recevant de l'oxygène n'est pas toujours supérieure à celle du groupe témoin au 1er essai, mais le devient toujours, et souvent de façon significative, au second essai; ceci semble indiquer, avec toutes les réserves nécessitées par le nombre restreint de nos sujets que le déficit d'oxygène qui existe à 10,000 pied a des effets sur les facultés supérieures, en particulier sur celle d'apprendre.

(25) **Rôle of the Liver in the Thyroxine Metabolism of the Albino Rat.** B. Grad (by invitation), and C. P. Leblond, Department of Anatomy, McGill University, Montreal.

(31) **Metabolic Effects of Adrenocorticotrophic Hormone (ACTH) Administered to Man.** M. M. Hoffman, H. T. McAlpine (by invitation) and J. S. L. Browne, from the McGill University Clinic, Royal Victoria Hospital, Montreal.

Large doses (240 to 480 mgm.) of partially purified ACTH (Armour) were administered over a 24-hour period to five normal subjects who were maintained on a constant food and fluid intake. This treatment resulted in marked changes in electrolyte and water metabolism which were characterized by retention of water, sodium and chloride and an increased urinary excretion of potassium. This was followed by a diuresis and an increased excretion of sodium and chloride and retention of potassium. ACTH administration influenced protein and carbohydrate metabolism as revealed by an increased excretion of total nitrogen and uric acid in the urine and the occurrence of glycosuria. The glycosuria varied from 6 to 30 gm. and occurred in all subjects. The presence of glucose in the urine appears to be a consequence of two effects of the ACTH, namely a decrease in the capacity of the kidney tubules to reabsorb glucose and an increase in the concentration of glucose in the blood. The amount of extra nitrogen in the urine was insufficient to account for the glycosuria on the basis of increased gluconeogenesis. That the ACTH stimulated the adrenal cortex in these subjects is indicated by the marked increase in the urinary excretion of 17 ketosteroids and glucocorticoids.

(41) **Mitochondria of the Villus Epithelial Cells of the Finest Bronchioles of the Albino Mouse, and their Experimental Alteration "in vivo" by Ascorbic Acid.** Charles C. Macklin, Department of Histological Research, the University of Western Ontario.

(55) **The Nutritional Status of the Eskimos. II. Ascorbic Acid.** R. G. Sinclair, Malcolm Brown, L. B. Cronk and F. deSinner (by invitation), Departments of Biochemistry and Medicine, Queen's University.

The level and source of the ascorbic acid intake of the Eskimo is one aspect of their nutrition that is of particular interest. Accordingly, the studies made on Southampton Island in the summer of 1947 included determinations of the ascorbic acid content of the whole blood of 78 Eskimos, of both sexes and various ages.

The values were found to range from 0.1 to 1.4 mgm. per 100 ml., with a mode between 0.6 and 0.8 mgm. The low values seemed readily understandable on the basis of observations and information as to the standard diet. The higher values were presumably due to supplementation of the standard diet with the roots, leaves, blossoms or berries of certain plants. No decisive information on this point was obtained.

In the summer of 1948, the earlier studies were confirmed and extended by determinations of the ascorbic acid content of the blood, plasma, and white cells, and of the daily output of ascorbic acid in the urine. More detailed information was also obtained concerning the practice of eating the native wild plants. That it is a highly individual one is nicely illustrated by the extreme differences in the ascorbic acid levels in husbands and wives.

## NOTES ON GENERAL PRACTICE

[This column will be devoted to points concerned with general practice. Questions are welcomed. They will be answered by well qualified men. Other short contributions or notes on general practice will also be welcome. General practitioners are particularly invited to make use of the column. All communications should be signed, but the writer's name will be omitted on request.—EDITOR.]

Q. Have rice diets proved of any value in hypertension or is it a passing fad? C.E.A.H., Toronto.

A. The so-called rice diet has been reported as having striking effects in lowering hypertension, both clinically and experimentally. It is not yet certain how this effect is produced. In effect this is a starvation diet, and it may be that the starvation in itself is responsible. Observations on large numbers of starving people during the war confirmed the fact that starvation lowered high blood pressure. But with the return to normal diet pressures were apt to rise again. Cardiac failure also may occur as a result of semi-starvation. The restriction of sodium intake in this diet may be the factor concerned. In any case the diet is extremely unpalatable, so much so that some patients cannot tolerate it. Whether it is a passing fad or not cannot yet be decided. It certainly has not gained universal approval.

Q. At what per cent haemoglobin would a blood transfusion be indicated just prior to delivery in a woman with a pregnancy anaemia, who is otherwise normal? C.E.A.H., Toronto.

A. The continued usage of percentages to describe haemoglobin levels is confusing. Some instruments are so calibrated that 100% equals 15.6 gm. of haemoglobin, others so that 100% equals 15.8 gm., still others (such as the Sahli) so that 100% equals 17 gm.

In the non-pregnant woman the normal haemoglobin level is 14.2 gm. %. During pregnancy the blood is gradually diluted by a protein-free fluid, causing an increase in blood volume. Because of this change the normal haemoglobin level near term amounts to only 12.2 gm. This is physiological and is not due to a true anaemia. Converted into percentage, the normal level near term can be accepted as amounting to 70% (Sahli) or 77% with other instruments using the 15.6 or 15.8 scale.

It is obviously not possible to state dogmatically at what level a transfusion would be indicated below these figures. If one draws a parallel between the undelivered patient, and the surgical patient before operation, one would be justified in administering transfusion only when the haemoglobin levels had been recorded below 55% (Sahli).

Q. Are long car rides on smooth roads conducive to miscarriage? C.E.A.H., Toronto.

A. No. Evidence accumulated during the recent war seems to have proved conclusively that travel will not increase the risk of miscarriage. In several large series, carefully studied, the incidence of abortion and mis-



carriage among women who travelled long distances was not increased over those who remained at home.

Obviously the threat of mis-marriage cannot be predicted far in advance, and the woman who travels long distances must take the same chances as one who repairs near her home and hospital.

**Q. What is the treatment of postnatal discharge?**  
C.E.A.H., Toronto.

A. The most common cause of the thick, mucoid discharge complained of in the postnatal period is that which comes from the eroded cervix. Treatment by electric cautery is universally successful. It should of course be delayed until involution has been completed, and preferably following the menstrual period. Care should be taken to avoid deep cautery of the cervical canal in the postnatal case, because stenosis is prone to occur.

**Q. Have there been any fatalities from induction of anaesthesia with vinethene?**

A. No fatalities have been reported from the use of vinethene as an anaesthetic.

**Q. Is there any definite therapy for brittle nails?**  
C.E.A.H., Toronto.

A. Brittleness of nails or fragilitas unguium, is a common complaint, particularly among women. This condition may be due to (1) pathological conditions such as Darier's disease, psoriasis, syphilis, etc., (2) avitaminosis, due to lack of vitamin A, (3) hypothyroidism and (4) manicuring. Of these, the last is the most common.

The apparently normal nails break off at the free edge, the fracture affecting the total thickness of the nail or only a few superficial layers, leaving a chipped or flaked edge. This is particularly frequent when the nails are trimmed or filed to a triangular shape.

The cause of brittleness in these cases is excessive and too frequent manicuring. The constant use of enamels and of ethyl acetate or acetone to dissolve them produces excessive dryness due to extraction of cholesterol and fat and thus the nails lose their elasticity. Schwartz and Peck believe, however, that varnishes and lacquers applied to the nails seal the surface so that moisture cannot be given off and this probably is what splits the nail plate layers. They do not believe that the nail lacquer solvents are at fault. They state that when the lacquer is removed, the moisture which was dammed back in the keratin by the lacquer is allowed to evaporate and the layers of the nail plate come together again.

Treatment of this condition, therefore, consists in avoiding the too frequent use of lacquers, bathing the nails in warm water, followed by massage with olive oil. Treatment required for the first three groups of causes is self evident.

Dr. J. K. Pomeroy of Lemberg, Sask., reports the following:

"On April 5, 1948, I was called to a maternity case thirty miles away. When I arrived the woman was in labour. I diagnosed twins. I had not been in the house many minutes when I delivered the first baby, a girl, breech, and divided the cord. The next presentation was a placenta. At this point there were two cords leading into the uterus, at the end of one a placenta. Then came the second baby, a boy, vertex. As I had not severed the cord, I had the second baby and placenta delivered and the placenta belonging to the first child was expressed in a few minutes. The woman made an uneventful recovery.

"I do not know the woman's history as I saw her only once. I do know she was a para II with the first child four years of age. This is a rare condition. The first was factor A placenta B factor B. The second was factor A placenta B factor B."

## MISCELLANY

### SOILS AND HEALTH\*

Paul B. Sears, Ph.D.

*Professor of Botany, Oberlin College*

There are between three and five million acres of land in Ohio which are not well suited to agriculture. It has frequently been suggested that this inferior land would be ideal for game production. Unfortunately, we know that land which will not produce healthy crops and livestock is not much good for the production of wildlife. The statement can be extended to cover people as well as rabbits, pheasants, and squirrels.

No doubt a goodly number of Ohio doctors have attended the Kentucky Derby at one time or another. If so, they have been impressed by the beautiful pastures, homes, and farm buildings of the Blue Grass region. The quality of horses bred there speaks for itself. But the secret of the Blue Grass region lies neither in the fine breeding stock nor in the skill and wealth of the owners. It is to be found instead in the abundant calcium and phosphorus of the soil. Where these have been exhausted, as sometimes happens, the best pedigrees and trainers fail to produce winners.

The situation repeats itself in the phosphate basin of Tennessee, the limestone regions of Missouri and Texas, and the Osage Hills of Oklahoma. In all of these places the livestock is vigorous and the people are prosperous.

#### PEOPLE, TOO

Yet every one of these favourable areas is surrounded by mineral-deficient soils and there the contrast is startling. In less than a hundred feet one may move from a thriving, well-to-do region to the other extreme. Livestock grown on the poor soils just outside the Blue Grass, or the other rich areas I have mentioned, is inferior. It exhibits defects in posture, development, and vigour that are unmistakable. The people who live on these inferior soils are poor—a situation often, but unjustly, attributed to a lack of enterprise. The late Carl Blackwell, then dean of agriculture at Stillwater, Oklahoma, a man thoroughly familiar with the South, told me that he had repeatedly observed the same defects of posture, development, and vigour in human beings that are found in animals grown in these deficient areas. While Dean Blackwell was not a physician, he was a competent scientist. I may add that my own observations support his.

Several years ago I was driven through the region around Spartanburg, South Carolina, by a quarry operator. The soils there are derived from granite, and are now heavily eroded. Aside from potassium, few of the important mineral nutrients are present in any large amount, even in the topsoil. The low economic status of the eroded land was evident. My guide remarked, "We have to keep a special table to feed up the workmen who come to us from this territory. Otherwise they are physically unable to do a good day's work." Presently we reached an area that had escaped erosion. The topsoil, although far from perfect, was still in place. Buildings and fences were well kept. Then I was told that men who came from these homes were vigorous and satisfactory workmen.

Other indications of the influence of soil that may be noted are as follows:

1. The bone weight of livestock of identical age and

\* Presented before the Section on the General Practice of Medicine at the annual meeting of the Ohio State Medical Association at Cleveland, May 6 to 8, 1947. Reprinted by permission from *The Ohio State Medical Journal*, March, 1948.

breeding may be only one half of normal in those raised on deficient soils

2. The calcium content of vegetables and the iron content of milk respond definitely to soil composition

3. Vitamin C content in tomatoes can be tripled by a trace of added manganese, and vitamin A in apples increased by the addition of needed boron

4. The vitamin and fat content of milk certainly responds to dietary differences

#### WE NEED TO KNOW

The situation with respect to minerals in milk is not so clear. I have found a tendency among American workers to assume that the calcium and phosphorus levels are maintained on any diet and that milk is thus protected, the direct effect being upon quantity, not quality. In Great Britain there is certainly experimental evidence to support the belief that mineral composition of milk is considerably affected by diet. If prices were as sensitive to calcium and phosphorus content as they are to butterfat percentage, we should see this debate ended promptly by scientific experiment, one way or the other

Under the Bankhead Jones Act of 1933, a number of regional research laboratories have been established by the Department of Agriculture. One of these nine laboratories, located at Ithaca, New York, has been charged with investigating the problem of nutrition from soil to plant, to animal, and from animal to human being. This is exactly the kind of information that is needed

In *Science* for April 18, 1947, Dr. Leonard A. Maynard, director of the school of nutrition of Cornell University, discusses the problem of nutrition, presenting what I regard as a conservative position. Since he should be quite familiar with the work of the regional laboratory at Ithaca, his remarks have special interest

Noting the importance of discoveries already made through the study of laboratory and farm animals, Dr. Maynard stresses the need to push such work as far as possible before using human beings as guinea pigs. What is true for the lower animals is not necessarily true for man, but nutrition for both begins with the soil. Experience with grazing animals has demonstrated the importance of phosphorus, copper, calcium, and other minerals in the soil. Dr. Maynard's comments on cobalt are striking. "It has been found", he says, "that 0.1 mgm. of cobalt daily makes the difference between life and death in a sheep; a lack of this minute amount was responsible for the death of tens of thousands of animals yearly before the discovery was made. This mineral is probably unimportant in human nutrition, but we are not sure about this."

#### AN ADVANCED GUARD

Dr. Maynard also emphasizes the need for fundamental studies on the relation of soil and soil treatment to the mineral content of plants and to protein and vitamin metabolism as well. In his words, "We are very ignorant of this phase of plant physiology". He deplores the statements of enthusiasts and responsible writers warning of the dangers of food from deficient soil, and asserts flatly that no alteration of the ration, much less of the soil, can influence in any significant way the amount of calcium, phosphorus, protein, or iron an animal puts into its milk or muscles. In view of his plea for further research, I find this dogmatic statement somewhat disconcerting. As I have said, it represents the prevalent view of American nutritionists.

Whatever censure may be due to the enthusiasts and responsible writers whom Dr. Maynard chides, they form a very lively Advance Guard which is responsible for growing popular interest in the relation of Soil to Health. The group includes, among men with a background of professional scientific discipline,

Dr. William Albrecht, of the Missouri Experiment Station, Dr. Jonathan T. Foman, editor of the *Ohio State Medical Journal*, and Dr. Weston Price, formerly of Cleveland. It also includes publishers with a considerable measure of practical experience, such as Sir Albert Howard, Louis Bromfield, and J. E. Faulkner. It is not surprising that active Soil and Health clubs have grown up around the fringes of this Advance Guard. The main tenet of such groups is that by promoting normal biological processes in the soil and returning all possible organic matter to the soil, healthy plants, livestock, and human beings will be produced. At times some of the more enthusiastic overdo things—for instance in their denunciation of all artificial fertilizers. But they are, in general, on the track of a very important truth.

Those who insist on the importance of soil in relation to health are not working blindly. Aside from specific facts such as I have already cited, they are drawing upon a respectable body of knowledge which deals with the large relationships in nature. I refer to the science known as ecology, whose principles they are attempting to apply.

#### THE RULES OF THE GAME

Ecology, like all of natural science, rests upon the laws which govern the behaviour of energy and matter. These laws postulate order in all physical processes. They also express a universal tendency of every process to work toward a condition of equilibrium. The processes whereby life and environment are interrelated are no exception.

Natural soil tends to develop, through the constant activities of generations of plants and animals, toward a higher level of efficiency in the use of energy. The ultimate level reached depends upon the particular climate and water supply. It also depends upon the minerals present in the surface material, but differences in this respect tend to be modified by the action of animals, wind, and water which bring in materials from outside. It is for these reasons that natural, or virgin soil is as a rule highly productive, and its products wholesome.

Man is a relative newcomer on the earth, having been present for a doubtful two million of the two billion years of earth history. He therefore has the benefit of a long process of preparation, both in the evolution of suitable types of plant and animal life, and the development of a very specialized habitat. He is not the independent lord of creation that he imagines himself to be, but rather the lucky inheritor of a very specialized set of conditions. Yet it is his perverse genius to destroy the very kind of environment which he must have to survive. In agriculture his first action is to remove the natural cover which has produced the virgin soil. Unless his practices are extremely skillful they expose the topsoil to removal and arrest the process of its development and maintenance.

#### LAND USE BAD AND GOOD

A great deal of what has been called agriculture had better be described as mining. It is exploitation, pure and simple. Such crops as tobacco and wheat make heavy demands upon the minerals of the topsoil, which are thereafter sold off the land. Clean tilled crops, such as corn, tobacco, and cotton, expose the ground between rows to washing. In this way amounts of topsoil running from one to fifteen tons per acre or more may be lost annually, and the slowly accumulated minerals go along. Moreover, the water holding capacity of the soil is lessened, and water runs away instead of being stored underground. The amount of plant and animal remains is reduced, so that beneficial soil bacteria have nothing to live on.

In contrast, good land practices follow the model of nature. As much of the ground is kept in continuous cover as possible. Minerals which leave the farm in the form of finished products are returned to

the soil in equivalent amounts. A balance between plants and animals is maintained, so that organic material is kept on the farm.

On a larger scale, this should apply to the wastes of cities where farm products are consumed. It is estimated that the City of Cleveland, which now burns its garbage, destroys daily organic matter equal to that produced in one year by a 300 acre farm. Properly conserved, this would yield considerable fat for industrial use, and organic fertilizer which is badly needed on the truck farms which feed Cleveland.

We cannot as yet trace all of the clinical consequences of eroded and depleted soil. But we do have ample scientific evidence that the capacity of such soil to produce and sustain healthy human communities is low, and that human depreciation runs parallel to soil depletion. We know better than to tolerate what has been happening.

There are over 6,000,000 farms in the United States, and more than 230,000 in Ohio alone. In contrast, the production of steel, automobiles, rubber, and aluminum is each highly concentrated in the hands of a few companies. It is no wonder that scientific management in industry is far ahead of that in farming.

#### WHAT WE CAN DO

Great advances have been made in the past fifteen years, but they are a mere drop in the bucket. The necessary reform in soil management is a stupendous problem, calling for the co-operation of every possible agency. The most effective means we have is through the organization of soil conservation districts, usually embracing an entire county in each district. A technical expert is then furnished by the government, but the farmers elect a committee to decide upon the practices they will follow.

Where these districts are in operation it has been found that soil, moisture, minerals, and organic matter are conserved. The level of production and farm income improves, and unquestionably the quality of crops and livestock is raised. It has also been found that the interest and influence of city groups is an important factor in establishing these districts. I would say, therefore, that the most direct and practical action that The Ohio State Medical Association could take on this question of the relation of soils to health would be to encourage, by every means in its power, the formation and operation of such districts. In Ohio, several counties, representing some of the best agricultural land in the state, are not yet organized.

As a second measure, I should urge attention to the proper conservation of sewerage, garbage, and other urban wastes which ought to be processed and returned to the land. There is need, too, for more adequate health service, especially in rural areas. Attention should be given to faults of posture, signs of lowered vitality, and other evidences of malnutrition. In this undertaking, especially in the calcium-deficient areas of the state, I would strongly urge that medical men exchange information with the veterinary profession, which is in a position to recognize the immediate and direct effects of soil deficiencies, and also with soil scientists.

I have no doubt that detailed research will presently indicate what clinical measures, if any, are needed to meet problems arising from the soil. But in the meantime I am certain that the simple measures I have suggested will go far toward making the ultimate use of clinical procedures unnecessary. The good physician is, after all, fundamentally a conservationist. And the ideal of a good conservationist is to work himself out of a job.

#### Ascorbic Acid and Industrial Poisons

The possible rôle of vitamins in detoxication processes has been studied frequently. The practical importance of decisive knowledge on any specific protective action of a vitamin against an industrial toxin is obvious. Benzene is a widely employed potentially toxic

industrial solvent. Signs of benzene poisoning include petechial hemorrhages, a clinical sign also seen in scurvy. The hemorrhage in the former condition, however, is on the basis of thrombocytopenia in contrast to the deficiency disease. Another superficial relation between ascorbic acid and benzene is the rôle of ascorbic acid in the breakdown of the amino acids, tyrosine and phenylalanine, both of which contain benzene rings. These relations have often given rise to the suggestion that ascorbic acid may exert a specific protective action against benzene poisoning (see B. Ekman, *Acta physiol. Scandinar. (Suppl.)* 22: 12, 1944.)

An attempt at a direct approach to the question of a relation between benzene poisoning in man and ascorbic acid metabolism has appeared (S. Forssman and K. O. Frykholm, *Acta med. Scandinar.*, 128: 256, 1947.) This paper reports studies of the urinary concentration of and tests for "saturation" of ascorbic acid on two groups of workers who were exposed to benzene, and on a control group of workers who received no exposure. Random specimens of morning urine (not twenty-four hour samples) were analyzed titrimetrically for ascorbic acid, gravimetrically for total and inorganic sulfate (difference = ester sulfate), as well as for other products of benzene degradation. The "saturation tests" were carried out by oral administration of 600 mgm. of ascorbic acid on the first day, and 300 mgm. daily thereafter until two urinary concentrations of 7 mgm. % were obtained. One hundred and two roto-gravure workers were studied; these were approximately equally divided into exposed and control (non-exposed) groups in each of two plants. The benzene concentration of the room air in which the exposed groups worked averaged 1.1 and 0.41 mgm. per litre, respectively, in Plants I and II.

The average urinary ethereal sulfate concentration paralleled the average exposure to benzene and was not affected by the administration of ascorbic acid. Prior to administration of ascorbic acid the findings in Plant I compared as follows for the exposed and control groups: average concentration of urinary ascorbic acid, 2.2 and 1.7 mgm. %. The average results of the saturation studies in the same groups were respectively: number of days of dosing before saturation was obtained, 8.4 and 6.7; maximum ascorbic acid concentration of urine, 14.2 and 23.1 mgm. %. The variation between individuals was great so that interpretation of these means should be cautious. A statistically significantly larger number of exposed workers were judged to be unsaturated in each of the plants.

The workers concluded that "... exposure to benzene produces an increased requirement of vitamin C and that an extra supply of vitamin C gives increased resistance to the effects of benzene vapours." A more valid conclusion would appear to be that persons exposed to vapours of benzene may have lower ascorbic acid stores than workers who are not so exposed. No evidence is here presented that benzene increases the requirement. The observed effect of exposure on urinary level could merely reflect differences in dietary intake which, in turn, might have been conditioned by exposure to the benzene. An illustration of the need for more precise thinking in arriving at a conclusion from such data as these is provided by the excellent report of E. E. Evans, W. D. Norwood, R. A. Kehoe, and W. Machle (*J. Am. M. Ass.*, 121: 501, 1943) in which they studied ascorbic acid in relation to another industrial toxin, lead.

These investigators studied the effects of ascorbic acid status on 72 workers in a tetraethyl lead plant. The group of workers had been under careful observation for years, and a background of data was available on them as to lead excretion in the urine and stool, symptoms, illnesses, and other pertinent medical observations. Preliminary observations of the ascorbic acid nutrition of the "exposed" group as compared with a similar control group which was not exposed to lead may be summarized as follows: A higher percentage of the exposed group had low plasma ascorbic acid levels.

low twenty four hour urinary excretion of ascorbic acid, and were judged as unsaturated on the basis of a urinary saturation test as well as a test which measures the rise in plasma ascorbic acid following a standard injection of the vitamin (L. Kujdi, J. Light, and C. Kujdi, *J. Pediat.* 15: 107, 1939). These tests were not made on all of the subjects, but the results of each type of measure revealed corresponding differences between the groups.

Thirty six of the "exposed" men were given 100 mgm. of ascorbic acid daily by mouth for one year. The other 36 "exposed" workers served as unsupplemented controls. Identical data were kept on the supplemented and unsupplemented exposed individuals. These included symptomatology, physical findings (especially blood pressure), hematologic studies, and concentration of lead in blood, urine, and stools. No effect of the supplementation could be discerned on lead concentration in blood, urine, or stool, hematologic findings, on physical condition of the workers, or on the number and severity of complaints. These conclusions were based upon a comparison of the data from the supplemented group with those from the unsupplemented exposed group as well as a comparison of the supplemented group with the accumulated background of observations previously made on them. The investigators concluded that no reason was found for recommending the use of ascorbic acid to minimize the effects of lead absorption.

Here then, is an example of a critical therapeutic testing of an initial suggestive correlation between factors. The correlation had been consistent with a hypothesis that ascorbic acid might be expected to minimize the effects of the industrial poison. The test did not bear out this expectation. Such experiences emphasize that correlation does not signify causation. The implication of the observations in this study of lead poisoning for the one reviewed on benzene toxicity is obvious.

It is to be hoped that investigations will continue of seemingly promising leads concerning the relation between vitamins and industrial poisons, such as ascorbic acid and benzene. The problem should be clearly defined, however, and the conclusions soundly based upon the facts—*Nutrition Reviews*, July, 1948.

## GENERAL MEDICAL COUNCIL

### British Pharmacopœia

#### Pharmacopœial Names—Approved Names

New names of drugs have been made official by their use as the titles of monographs in the British Pharmacopœia. Names for certain other drugs, for which no official monographs are provided, have been published as Approved Names, the intention being that if any of the drugs is eventually described in the British Pharmacopœia, the Approved Name shall become its official title. The recognition of an Approved Name does not imply that the substance will necessarily be included in the Pharmacopœia. These names are now brought together for reference, together with other names under which the drugs have been known. For some drugs numerous other names have been introduced, the lists that follow include, in most instances, under Other Names, only the names under which the substances were originally introduced; some of these names are registered trade marks.

Since the intention is to give recognition to non proprietary names which may be used freely by manufacturers, and thus to avoid the difficulties which arise from the multiplication of names for the same substance, it is hoped that the Approved Names will be generally adopted and used in prescribing. The introduction of new names for substances for which Pharmacopœial names or Approved Names are available is especially deprecated, but if a manufacturer should desire to issue under a proprietary name a drug for which an Approved Name has been provided, it is strongly recommended that the label shall bear the Approved Name of the

substance in letters no less conspicuous than those in which the proprietary name is printed or written.  
*General Medical Council Office,*  
44 Abchurch Lane, Portland Place,  
London, W.1.

#### Names Made Official by Means of Addenda to the British Pharmacopœia, 1932, and by Means of the British Pharmacopœia, 1948

Pharmacopœial Names	Other Names
Acetarsol	Stovarsol
Acetomenaphthone	Kapilon Oral, Prokayvit
Amethocaine Hydrochloride	Dericaine
Aminacrine Hydrochloride	Acramine Yellow
Amphetamine	Benzedrine
Amphetamine Sulphate	Benzedrine Sulphate
Bromethol	Avertin
Butacaine Sulphate	Butin
Butyl Aminobenzoate	Butesin
Carbichol	Doril
Chimiofon	Iatrin
Cinchocaine Hydrochloride	Nupercaine
Deoxycortone Acetate	D O C A
Diodone, Injection of	Perabrodil
Diphenan	Butolan
Dithranol	Cignolin
Emulsifying Wax	Lanette Wax SX
Ergotamine Tartrate	Femergin
Hexobarbitone	Evipan
<i>Pharmacopœial Names</i>	<i>Other Names</i>
Hexobarbitone Sodium	Evipan Sodium
Hydrous Ointment	Eucerin (Hydrous)
Iodised Oil	Lipiodol
Iodoxyl	Uroselectan B
Leptazol	Cardiazol
Menaphthone	Kapilon
Mepacrine Hydrochloride	Atebrin; Quinacrine Hydrochloride, USP XIII
Mepacrine Methanesulphonate	Atebrin Musonate
Mersalyl, Injection of	Salysrgan
Methylphenobarbitone (Phenitoin)	Prominal
Neostigmine Bromide	Prostigmin
Neostigmine Methylsulphate	Prostigmin
Nikethamide	Coramine
Oxytocin, Injection of	Pitocin
Pamaquin	Plasmoquine
Pentobarbitone Sodium	Nembutal
Pethidine Hydrochloride	Dolantin; Demerol
Phenytion Sodium	Epanutin
Progesterone, Injection of	Proluton
Silver Protein	Protargol
Sodium Aurothiomalate	Myocrisin
Stibophen	Foundin
Sulphacetamide	Albucid
Sulphacetamide Sodium	Albucid Soluble
Sulphanilamide	Prontosil Album
*Sulphapyridine	Dagenan; M. & B 693
Suramin	Germann; Bayer 205; Antrypol
Theophylline with Ethylenediamine	Euphyllin; Cardophyllin
Thiopentone Sodium	Pentothal Sodium
Vasopressin, Injection of	Pitressin
Vinyl Ether	Vinethene
Wool Alcohols	Hartolan Wax
Wool Alcohols, Ointment of	Eucerin (Anhydrous)

\* Official in the Seventh Addendum to the British Pharmacopœia, 1932, but not included in the British Pharmacopœia, 1948

Approved Names	
<i>Approved Names</i>	<i>Other Names</i>
Centrimide	Cetyltrimethylammonium bromide; Cetavlon
Cyclobarbitone	5- $\Delta^1$ -Cyclohexenyl-5-ethylbarbituric acid; Phasmodorm
Dimercaprol	2:3-dimercaptopropanol; British Antilewisite; B.A.L.
Dimethylstilbamidine	4:4'-Diamidino- $\alpha$ - $\beta$ -dimethylstilbene
Hexazole	4-Cyclohexenyl-3-ethyl-1:2:4-triazole; Azoman; Triazole
Maphenide	<i>p</i> -Aminomethylbenzenesulphonamide; Marfanil
Meprochol	Trimethylmethoxypropenylammonium bromide; Esmodil is a 0.3 per cent. isotonic solution
Mesulphen	2:6-Dimethylthianthrene; Dimethyldiphenylene disulphide; Mitigal
Pentamidine	$\alpha$ : $\omega$ -(4:4'-Diamidinodiphenoxy) pentane
Pheniodol	$\alpha$ -Phenyl- $\beta$ -(4-hydroxy-3:5-diiodophenyl)-propionic acid; Biliselectan
Pholedrine	$\beta$ -Methylamino-4-hydroxypropylbenzene; Veritol
Proguanil	<i>N</i> - <i>p</i> -Chlorophenyl- <i>N</i> -isopropylbiguanide; Paludrine
Propamidine	$\alpha$ : $\omega$ -(4:4'-Diamidinodiphenoxy) propane
<i>Approved Names</i>	<i>Other Names</i>
Sodium Stibogluconate	Sodium antimonyl gluconate; Pentostam
Stilbamidine	4:4'-Diamidinostilbene
Sulphadimidine	2-( <i>p</i> -Aminobenzenesulphonamide) 4:6-dimethylpyrimidine; Sulphamezathine; Sulphadimethylpyrimidine
Thialbarbitone	5- $\Delta^2$ -Cyclohexenyl-5-allyl-2-thio-barbituric acid; Kemithal
Thiomersalate	Sodium ethylmercurithiosalicylate; Merthiolate

### An Idea About Income Taxes

Let any man say that he has an idea about income taxes and we'll listen till the cows come home. A short time ago we ran into Joseph Sedgwick, Toronto K.C., and he held us so enthralled that we forgot we were on our way to lunch.

Mr. Sedgwick said he had been contemplating the lot of professional men who pay out a considerable part of their earnings in income taxes. These taxes enable the Government to retire generals, admirals and air marshals at comparatively early ages on comfortable pensions, and pay a share of civil service pensions. But, in what often is a relatively brief period of high earnings, this type of taxpayer cannot keep enough money to provide for his own security in old age.

Consider the example of many surgeons, said Mr. Sedgwick. They work their way through university, graduate in their mid-twenties, walk the hospitals for some years, go abroad to study, return to work under an older man. During all this time they earn less than a garage mechanic. Finally, when nearly 40 years old, they are established, have patients aplenty, achieve an income of perhaps five figures. But they must live on a scale befitting a successful professional man, and pay to the Government just about 50 cents of every dollar. They haven't enough left to provide themselves with any substantial annuity. And before they are much over 60 they find that their hands aren't steady enough and their eyes not keen enough for the delicate operations that have brought them their income.

And that, said Mr. Sedgwick, approximates the story of many men in all professions.

He had, he said, figured out a solution. He didn't suggest it was perfect. He did think it was at least an approach to the problem of the taxpayer who pays for other people's pensions but never gets one himself. His idea was that the Government set up an account for every income taxpayer; that when his earning days are over, or at a fixed age, he should be paid a pension consisting of the income, at say 3%, on the total amount contributed by him in income taxes during his lifetime.

In short, under Mr. Sedgwick's scheme, the taxpayer would be buying old-age security as well as paying for government.—Napier Moore in the *Financial Post*.

## CANADIAN ARMED FORCES

### News of the Medical Services

Surgeon Commander H. R. Ruttan, O.B.E., R.C.N., who has been Command Medical Officer, Pacific Coast, for the past two years, has taken up the appointment of Assistant Medical Director General, R.C.N., at Naval Headquarters, as of October 11, 1948, relieving A./Surgeon Commander F. G. W. MacHattie, R.C.N., who is now serving afloat in *H.M.C.S. Ontario*.

The annual convention of the Association of Military Surgeons of the United States was held in San Antonio, Texas, from November 10 to 13 inclusive. It was attended by Surgeon Commander H. R. Ruttan, R.C.N., for the Medical Director General, Navy; Brigadier W. L. Coke, Director General of Medical Services (Army), and Wing Commander G. D. Caldwell, R.C.A.F., for Director of Health Services (Air). A very intensive review of medical achievements during the year was given by notable speakers; scientific displays were capably organized and well presented, clinics and panel discussions were held on subjects of interest to all service medical men.

Visits were made to the 1,900 bed hospital at the Brooke Army Medical Centre. Visits were also made to the United States Air Force School of Aviation Medicine at Randolph Field to witness an air show featuring: jet plane flying and aerobatics; air-sea rescue operation with para-doctors and para-rescue teams; helicopter manoeuvres and air rescue demonstration.

The annual conference of the Command and Area Medical Officers of the Army was held at Army Headquarters, Ottawa, on November 8 and 9, 1948, under the chairmanship of Brigadier W. L. Coke, O.B.E., R.C.A.M.C., Director General of Medical Services (Army). Previous to the Conference, on November 5 and 6, the officers had attended the annual meeting of the Defence Medical Association which took place at the Chateau Laurier, Ottawa, under the presidency of Colonel L. H. Leeson, O.B.E., of Vancouver, B.C.

Lieut.-Col. E. J. Young, R.C.A.M.C., and Lieut.-Col. C. B. Climo, R.C.D.C., detailed as medical and dental representatives of the Canadian Armed Forces, attended the third meeting of the United States Armed Services Field Medical Materiel Group at Camp Lejeune, North Carolina, from November 1 to 5, 1948. The group exists to develop and test field medical equipment, and the meeting provided a valuable opportunity for the Canadian observers to become acquainted with the construction and use of the newest American apparatus for the evacuation and treatment of casualties.

Shortly after the late war, a training program for officers of the R.C.A.M.C. was commenced with a view towards maintaining a high professional standard in the Corps as a whole and also towards providing sufficient specialists. Aside from experience gained in service and Department of Veterans' Affairs hospitals, selected officers are now given postgraduate university and hospital training in Canada and the United States. Already 14 Active Force medical officers possess recognized high qualifications in medicine, surgery, anaesthesia or public health, and 7 others are at present being trained in these fields.

Sir Archibald MacIndoe, C.B.E., Consultant in Plastic Surgery to the R.A.F., was recently guest speaker to the R.C.A.F. Staff College, Toronto. He discussed the general questions of Air Force burns, plastic surgery and the important relationship existing between aircrew and the proper use of their protective equipment.

At the R.C.A.F. Wing of East Grinstead Hospital, over 170 Canadian servicemen received plastic surgery treatment during the recent war. This was carried out by the staff of Group Captain Tilley, O.B.E., R.C.A.F., under the direction of Sir Archibald MacIndoe. All such cases belong to a unique organization called the Guinea Pig Club, and during his recent visit to Canada an organizational meeting was held to form a Canadian Wing of the Guinea Pig Club. Approximately 30 of the ex R.C.A.F. Guinea Pigs attended the initial meeting in Toronto and plans were laid for inclusion of all the remaining members in Canada.

## CORRESPONDENCE

### Fee Splitting

To the Editor,

I have read and re-read with considerable interest your Editorial on Dichotomy in the issue of November, 1948. In spite of the concise presentation of the topic therein I feel that it has been accorded rather superficial treatment. While concurring wholeheartedly with the principles you infer, it seems that these very principles are not adequately emphasized.

Surely dichotomy is harmful only because of the possible odious practices which determine its employment. But you admit the existence of a legitimate dichotomy and quote group practice as an example. It is your inferred conclusion in this example which I feel has been too hastily stated. Is it not possible for the precedent evils of dichotomy to exist even in a group practice? The fact that a division of fees occurs in group practice should not, in my mind, automatically dispel the unsavoury aura of the act generally, nor should it be permitted to whitewash the consciences of the practitioners constituting the group. If your theorem is correct, then any two or more unscrupulous practitioners would be able to salvage their reputations simply by announcing their professional association in a group.

I fail to see why the division of a fee amongst members of an organized group is in any sense, *per se*, different from the division of a fee amongst a few unorganized medical men, all of whom have attended a patient. While "intolerable temptation" may sometimes exist in both cases, I submit the criterion of objection should be the existence of unprofessional purpose rather than the method of fee collection and division.

C. E. CORRIGAN

Medical Arts Bldg.,  
Winnipeg

## Visiting the United Kingdom

To the Editor:

The Empire Medical Advisory Bureau has been established by the Council of the British Medical Association with a view to welcoming and providing a personal advisory service to practitioners visiting the United Kingdom, particularly those from the Dominions and Colonies. The Bureau was officially opened by Lord Addison (Lord Privy Seal) on July 13, 1948 at a reception given by the President and Council of the British Medical Association at B.M.A. House and since then the use made of the Bureau has shown a gratifying and steady increase.

In the first three months some three hundred overseas doctors have made either written enquiries or personal visits. Just over half of their queries have concerned the various aspects of postgraduate education whilst one quarter dealt with the difficult problem of finding some where to live. General enquiries make up nearly one fifth of the total and cover a wide field, e.g., from advice on the inoculation of infants to information on petrol rationing in European countries.

In those cases where doctors have let us know of their impending arrival, the Port Health Officers have been glad to meet and welcome our friends and pass on any urgent messages re accommodation.

We have made a start at arranging social functions at which the visitors have an opportunity to meet members of the profession in this country, and in spite of evening lectures and clinics nearly 200 overseas doctors and wives have been able to attend these to date.

Our modest activities to date are but an earnest of our intention to make our overseas visitors feel at home as soon as possible in this country.

It will enable the Bureau to be of most service if a visitor gives as long notice as possible of his intended visit to this country and information on the following lines would be useful: projected date of arrival, mode of travel, whether accompanied by wife, period of stay, main and other objects of visit and requirements from the Bureau. A letter of introduction from the local Hon. Secretary of the visitor's Medical Association whilst not essential, would be welcome.

All letters should be sent to me at the undermentioned address.  
H. A. SANDFORD  
Medical Director

Empire Medical Advisory Bureau  
British Medical Association House  
Tavistock Square  
London, W.C.1

## Popular Articles on Health

To the Editor,

On page 363, in your October issue Dr H. M. Harrison asks what can be done about the health articles appearing in the newspapers and in popular magazines. A short time ago I had a patient call to see me. She had a swelling which she was afraid might be cancer. A health magazine she had with her, described on its cover a special article on cancer. On enquiry, I ascertained that she had read this article. I treated her condition, which cleared up completely in a short time. I also advised her to stop reading health magazines.

In reply to Dr Harrison's question, may I respectfully suggest the inauguration of a popular health journal under the auspices of the Canadian Medical Association—and on the lines of "Hygiene", of the A.M.A. Further, newspapers and magazines should be asked to drop their health articles, and if they persist—obtain legislation to enforce such restrictions in the interest of public health.

Judging by the volume and extent of health publications, the general public is undoubtedly interested in the

subject. The Canadian Medical Association could cater for this interest and supply truthful, but unsensational articles written by doctors, not propagandists.

SAMUEL POZNANSKY

Dawson, Yukon Territory.

## SPECIAL CORRESPONDENCE

### The London Letter

(From our own correspondent)

#### SOME FACTS AND FIGURES

To attempt to assess the present status of the National Health Service is clearly difficult, but certain figures which have recently been issued by Government representatives are of more than passing interest. In England and Wales 18,165 general practitioners out of a total of 21,000 are participating in the scheme, and 8,519 out of 10,000 dentists. In addition, there are 5,000 ophthalmic opticians and dispensing opticians and 14,000 chemists. The 2,587 hospitals which have been taken over contain 388,000 staffed beds. For the 40,000,000 people on doctors' lists prescriptions are being dispensed at the rate of 140,000,000 a year. The total amount paid or owing to dentists for the period, July 5 to October 30, is estimated to be £4,750,000, whilst the estimate for this service for the nine months, July, 1948 to March, 1949, was £7,000,000. About 1,700,000 people have had dental treatment and about 1,500,000 have been supplied with spectacles.

In contrast to this series of official figures, it is perhaps not unfair to record the report that in Surrey during the first quarter of the scheme, 300 dentists were paid nearly as much as 1,000 doctors, and that opticians were earning as much for seeing 10 to 12 patients a day as doctors were for seeing 50 patients.

#### FELLOWSHIP FOR FREEDOM

Under the energetic leadership of the veteran Lord Horder 700 doctors recently decided to form a new body called the Fellowship for Freedom in Medicine. The aim of this new organization is to attempt to maintain the doctor as an individual and not as a civil servant. Throughout its inaugural meeting constant emphasis was laid upon the point that this was not a breakaway from the British Medical Association, and that membership of the Fellowship was perfectly compatible with loyal membership of the Association. To judge the effect of such a new body is difficult. As a ginger group it might well subserve a useful function. One of the possible dangers of such an organization, and one of which the founders are probably well aware, is that it may tend to attract an undue proportion of the malcontents of the profession, whose attitude to the new shape of things is entirely critical without any constructive features.

#### INSTITUTE OF OPHTHALMOLOGY

The latest development in the gradual establishment in London of a Postgraduate Medical School worthy of the best traditions of English medicine is the opening of the new Institute of Ophthalmology which took place last month. This Institute, which has been set up in conjunction with the three leading eye hospitals of London, is to have a twofold purpose—postgraduate teaching and research. There are already 126 postgraduate students from seven countries (apart from Great Britain) attending the Institute. On the research side there are three main divisions: an ophthalmological research unit working on the physiology of the eye and ocular disease, under the direction of Sir Stewart Duke-Elder; a vision research unit under Professor H. Hartridge, and an industrial illumination unit under Mr. Weston. The Institute as a whole is under the supervision of Sir Stewart Duke-Elder.

#### INTELLECTUAL FREEDOM

The outspoken letter from Sir Henry Dale to the president of the Academy of Sciences of the U.S.S.R., resigning his honorary membership of the Academy because of the Academy's decrees restricting all research and teaching on genetics in the U.S.S.R. to politically imposed orthodoxy, has received full support from Sir Robert Robinson in his presidential address to the 286th anniversary meeting of the Royal Society. Sir Robert Robinson, however, has gone one step further and pointed out that the price of freedom in science is eternal vigilance. No direct attack on the freedom of science was likely in this country, but "conceivably it could take the more subtle form of control of the character and direction of our scientific work". The same point is made by the University Grants Committee in their latest report, where they draw attention to the possible danger to freedom of action in the universities arising out of the increasing proportion of the income of the universities in this country which comes from the Treasury. Thus, the proportion of the income of the universities derived from the Exchequer has risen from 34% in 1935-36 to 52% in 1946-47, and by 1951-52 it may exceed 60%.

The principle of central planning and of academic autonomy may not be irreconcilable, but if the relationship between the State and the universities is to be properly conceived as a form of partnership, the situation will need to be carefully watched by all those who treasure the three essential freedoms—of thought, of action and of speech. As the old country stands on the threshold of yet another New Year, this age-old problem of the freedom of the individual, whether doctor or patient, teacher or taught, looms once again on the horizon.

WILLIAM A. R. THOMSON

London, December, 1948.

### The Holland Letter

(From our own correspondent)

#### NATIONAL FOUNDATION AGAINST CANCER

Queen Wilhelmine of the Netherlands, who resigned after a reign of 50 years, installed a National Foundation against cancer, which was given to her by the Dutch people by way of a present for her long reign. More than one million guilders were raised by small gifts of the whole people for the Foundation.

#### WAR VICTIMS

The central office of statistics declare, that the total number of Dutch citizens, killed in or through the war, was 210,000 persons. About 104,000 of them were Jews, deported to Germany or Poland, killed in the gas-chambers. During the war-days in May, 1940, when the Dutch army fought against the German invaders, 4,000 Dutch soldiers were killed in action. The navy also lost 4,000 men. In Holland the Germans shot 2,500 political prisoners, and more than 18,000 political prisoners lost their lives in Germany. The winter of 1944 when food was very scarce in Holland, caused the death of 16,000 people. More than 20,000 civilians lost their lives by military action.

Notwithstanding the 210,000 war victims, the total population of the Netherlands is higher than ever before. In 1920 Holland had a total population of 6,865,314, nowadays the number is approaching the ten millions. Since the liberation the population increased by 475,000 persons. The increasing population creates a real problem for the government. Holland is now "exporting" people. Farmers went to Canada and in 1949 an ever increasing number of farmers will follow their fellow-emigrants to Canada. Other farmers are going to France. The Australian government invited former Dutch soldiers or men of the resistance-movement for settling in their country. The Dutch population is yearly increasing by more than 100,000 persons. War destruction of houses led to a shortage of 300,000 houses. This



year 30,000 houses will be constructed and next year 38,000 but it will take 25 years before everybody in Holland can find his own house or dwelling.

#### PRODUCTION OF PENICILLIN

With the help of some Dutch medical professors, amongst them Prof. Querido of the Leyden University, a Dutch firm started a year ago the production of penicillin. Nowadays the firm can cover the total needs of penicillin in Holland and in a short time it will be exported to countries like Denmark. J. Z. BARRECH

### The Australian Letter

(From our own correspondent)

#### NATIONAL HEALTH SERVICES

The Commonwealth Government's National Health Services Bill was given first reading in the Senate recently. Under the referendum of 1946, the Commonwealth Government was granted the right to legislate for the provision of medical and dental services. The referendum specifically excluded any form of civil conscription of doctors or dentists.

In introducing the bill, Senator McKenna, Federal Minister for Health, stated that the Government realized that a complete health service could only be achieved gradually, and the legislation envisioned a developing process over several years. The Bill provided for discussions with the British Medical Association and the Australian Dental Association.

Under a Director-General there were to be several directorates, each to have an advisory committee of practicing physicians in the appropriate branch of medicine.

State Governments, in whose hands health matters now rest, would not surrender their control of existing institutions to the Federal Government, but the Federal funds dispersed would be by way of grants to the States, and to other bodies, for hospital construction or improvement, equipment and maintenance, when this was provided at the Commonwealth's request.

The Bill is very comprehensive and covers the eventual provision of general and consultant medical and dental services, ophthalmic, maternal and child welfare services, aerial medical and dental services, as well as diagnostic, therapeutic, convalescent and nursery services. The establishment of hospitals, laboratories, health centres and clinics by the Federal Government is also envisaged. This government could also manufacture medical and dental supplies, including hearing aids, if the supply at hand was inadequate or the price unreasonable.

A prescribed schedule of fees is to be set up, and the Commonwealth will pay 50% of these fees for service rendered to the patient. This payment will go directly from the Government to the doctor, who will have to collect the other half from the patient personally. This clause of the Bill is to be implemented with all possible speed, once the legislation is passed. Full-time salaried posts were envisaged only for practitioners in the "out-back" where subsidies were obviously necessary, and for pathologists and radiologists in hospitals. Sessional fees for hospital attendance by specialists were being considered.

Senator McKenna said further: "The Medical Benefits Scheme involves no interference with the present practice of medicine. It does not involve any disturbance of the doctor-patient relationship. The patient will visit his own doctor in the usual way and, on his advice, will go if necessary to the appropriate specialist. The Commonwealth under this proposal undertakes to pay half the cost of the scheduled fee for consultation or specialist advice or treatment provided pursuant to the bill."

Group practice was to be encouraged. Lists of medical and dental specialists were to be prepared, having regard to similar lists prepared by an appropriate professional body.

The costs of the medical benefits scheme with full participation of doctors would be about £6,000,000 per year. The dental scheme envisaged would concentrate on public education concerning dental hygiene, regular dental treatment of all children, and extension of dental service to the outback. This scheme would cost £4,000,000 per year when fully operative. Both these sums would come out of the National Welfare Fund, which now receives the enormous tax collected for special security along with the income tax. Capital expenditure would have to come out of annual parliamentary appropriations.

Debate on the Bill will open next week, by which time all sections of the British Medical Association will have had special general meetings. These promise to be the best attended in history! Already the press has head-lined such matters as the provision of case histories to be read by civil servants, the position of the doctor if his patient refuses to pay the other half of the bill, and many other vexed questions.

Whatever transpires within the next month, all are agreed that increased provision must be made for Federal assistance to training institutions. The University of Sydney is reported to be in serious financial straits and is laying off men. The postgraduate facilities in the country are inadequate according to the senior men concerned with their extension. No scheme, medical or dental, has any chance of success here unless these problems are solved. The launching of practices by recent graduates who have had no year of internship, is another matter which is causing concern, and reflects the need for financial assistance at the postgraduate level, so that internships in newly-organized teaching hospitals may be offered. Three new teaching hospitals are joining the University of Sydney group, including the 1,600 bed veterans' hospital at Concord.

National Health and Medical Research Council grants for the coming year are increased over last, but there are still many applicants who cannot be assisted.

WM. GIBSON

## ABSTRACTS FROM CURRENT LITERATURE

### Medicine

**Nail Changes in Functional and Organic Arterial Disease.** Edwards, E. A.: *New England J. Med.* 239: 362, 1948.

The anatomy of the nail and its associated structures, nail plate, nail fold, cuticle and lunula is briefly and clearly described with diagrams. Attention is given to certain characteristic clinical changes occurring in vasospastic conditions, especially Raynaud's disease and scleroderma, chief of which is the thinning of the proximal nail fold and extension of the cuticle over the nail plate to form a pterygium. Its appearance may precede the clinical appearance of scleroderma. This condition has not been observed by the writer in purely organic vascular obstruction. It disappears after sympathectomy. In organic arterial occlusion, as in arteriosclerosis or Buerger's disease the characteristic changes are marked retardation of growth of the nail plate, often with thickening and transverse parallel ridging. Onychogryphosis ("claw nail") may result. Recent onset of pain in elderly persons is usually due to ischemic hyperaesthesia, but may be misinterpreted as due to ingrown toenail which may or may not be present. Any treatment which results in increased blood supply will restore normal growth and appearance, but operation in such cases for ingrown toenail may result in gangrene.

D. E. H. CLEVELAND



**Myelophthisic Anæmia the Presenting Manifestation of Prostatic Carcinoma with Skeletal Metastases: the Effect of Castration and Stilbæstrol.** Commons, R. R. and Strauss, M. B.: *Am. J. M. Sc.*, 215: 525, 1948.

These authors present three cases of prostatic carcinoma with widespread bony metastases in which a marked feature was anæmia. In the first two cases the anæmia was the main clinical finding and the patients had received considerable medication for it before x-ray of the bones revealed the true condition.

The third case, which has come to their notice since the introduction of present-day therapy and is the only one of the three therefore to receive castration and hormone treatment, presented a red blood count of 1,990,000 and Hgb. of 5.1 gm. %. He had marked bone pain, widespread x-ray metastases and an enlarged, bony-hard prostate; alkaline phosphatase was 16.8 Bodansky units. Attempts to improve the anæmia using iron and liver extract were unsuccessful but, following castration and diethylstilbæstrol, the general clinical condition improved greatly with disappearance of the bone pain and return of strength and well-being. The red blood count slowly rose to 4,000,000, the Hgb. to 12 gm. %. There was moderate regression change in the metastases as seen by x-ray.

The authors discuss the possible mechanism whereby the improvement in the blood picture occurred and find that Janet Vaughan's explanation of the anæmia of these cases as being the result of the mechanical replacement of functioning marrow by metastases useful in that it provides for a return towards normal should the metastases be reduced in size. They review the literature concerning the specific effects of castration and of stilbæstrol therapy and decide that improvement in the blood picture is not to be looked for from either of these procedures apart from what they may achieve in reducing the volume of the bone marrow metastatic deposit.

G. A. COPPING

**"C.B. 11"—A New Analgesic Drug.** Wilson, W. M., Hunter, R. B.: *Brit. M. J.*, 2: 553, 1948.

On experimental studies in human beings the pain-relieving properties of C.B. 11 (4,4 diphenyl-6-morpholinoheptan-3-one hydrochloride) have been compared with pethidine (demerol) and physeptone (amidone). This preliminary study suggests that C.B. 11 is a potent analgesic, comparing favourably with physeptone (amidone) and is apparently more active than pethidine (demerol) under conditions of the experiment. In a short clinical period it proved to be effective in the relief of some types of pain. There is no evidence at present that C.B. 11 is a drug of addiction. It is considered worthy of a more extensive trial.

ROSS MITCHELL

**The Treatment of Angina Pectoris with Propylthiouracil.** Hollander, G. and Mandelbaum, H.: *Ann. Int. Med.*, 28: 1150, 1948.

Depression of the basal metabolic rate with 6-propylthiouracil relieved substernal pain in four of ten cases of hypertension with angina pectoris for a six month period. The initial basal metabolic rate and the subsequent readings did not determine the final results. Myxœdema levels were not necessary for relief of pain, since three of the four patients who were relieved of pain had basal metabolic rates within normal limits at the time symptoms were improved. If improvement did occur, it did so within eight weeks of beginning treatment. Several untoward effects of 6-propylthiouracil treatment were noted, namely a tendency to water retention, and intermittent claudication. No toxicity with 6-propylthiouracil in doses up to 200 mgm. a day was observed. The ideal initial and maintenance dose of 6-propylthiouracil for the treatment of angina pectoris remains to be determined. If after adequate treatment for a two month period, there is

no symptomatic improvement, further administration is probably useless. Since propylthiouracil is relatively non-toxic and has shown benefit in some cases of angina pectoris, a further trial of its use is warranted.

S. R. TOWNSEND

**Factors Favouring Successful Transmetatarsal Amputation in Diabetes.** Root, H. F.: *New England J. Med.*, 239: 453, 1948.

Major amputations above the ankle for diabetic gangrene have become less frequent since it has been shown that transmetatarsal amputation will produce a useful and serviceable foot in many cases. A conservative approach to the treatment of diabetic gangrene has been aided by the advent of chemotherapy.

The line separating failure and success in transmetatarsal amputation is extremely narrow. While a deficient blood supply, as evidenced by absent arterial pulsation in the foot, is the most conspicuous feature in cases of failure of healing after operation, other factors are important, especially the known liability to infection of the tissues of the diabetic. Once healing is achieved a useful foot is obtained which stands the strain of walking for a long time. Of 133 transmetatarsal amputations performed on 122 patients in the New England Deaconess Hospital between 1944 and September 1947 failure of healing occurred in 22 cases, 19 requiring subsequent thigh amputations, one finally healing after several months at home and two being considered failures because of recurrence of ulceration in anæsthetic feet.

NORMAN S. SKINNER

**Chronic Subdural Hæmatoma.** LaLonde, A. A. and Gardner, W. J.: *New England J. Med.*, 239: 493, 1948.

Following operative evacuation of a subdural hæmatoma the compressed cerebral hemisphere may fail to expand, giving rise to cerebrospinal-hypotension which may be a grave prognostic sign. Expansion of the compressed hemisphere may be achieved at time of operation by the injection of physiologic saline solution into the spinal subarachnoid space or into the lateral ventricle. This procedure decreases or abolishes the subdural dead space, restores the brain to a more normal condition and usually brings about rapid improvement. Failure of expansion of the compressed hemisphere after evacuation of a subdural hæmatoma is more common in elderly patients who do not have increased intracranial pressure prior to operation.

NORMAN S. SKINNER

## Surgery

**Four Hundred Consecutive Cases of Jaundice.** Bachhuber, C. A. and Gilbert, A. E.: *Am. J. Surg.*, 76: 144, 1948.

Clinical observation remains the most valuable factor in the differential diagnosis of jaundice. Changing colour of the stool will point to a fluctuating icteric index and favour a diagnosis of lithogenic disease in place of pancreatic neoplasm. The presence or absence of pain is of some value, but a surprising number of patients die from painless obstruction of the common duct by stone or are subjected to operation for stone because they had pain only to find a malignant lesion. A laparotomy is necessary to prove the etiology and ameliorate or remove the fundamental cause. A patient who becomes jaundiced has 3½ chances out of ten of recovery. Of the 400 cases studied, 43% had malignancy, one-fifth carcinoma of gall bladder, ducts or ampulla and one-fifth metastatic carcinoma of the liver and one-half carcinoma of the head of the pancreas. Common duct stone was the cause of jaundice in 22%. The reason for jaundice was inflammatory in 16%, hæmolytic in 10%, cirrhosis in 5%, stricture in 1.5%, and unknown in the remaining.

The authors have no doubt that gallstones should be removed when first discovered. Catarrhal jaundice is

always recovered from. It should not be diagnosed in a patient over 50 years old, seldom over 30. Cholangitis is usually secondary to inflammation of the extrahepatic biliary system and surgery offers a cure with low mortality. Congenital hamolytic uterus is controlled by splenectomy. Congenital stricture of the newborn is always fatal. Acquired stricture is the surgeon's responsibility, and removal of the gallbladder from fundus to the duct is advised. BURNS PLEWIS

**Shock Caused by Extremity Wounds** Birchall, R.: *Am. J. Surg.*, 76: 51, 1948

Reviewing the 1,156 cases of shock admitted to an American Evacuation Hospital in France and Belgium, the lessons learned by military surgeons are presented. Many of these conclusions are applicable to civilian injuries. Since 99% of the patients treated for shock suffered primarily from loss of blood, rapid replacement of whole blood was the first necessity. Vasoconstriction can maintain a normal blood pressure in the presence of decreased blood volume, so that a fall in blood pressure is a late sign, not to be waited for before instituting shock therapy. Only 9 cases showed irreversible shock from hemorrhage and were not effected by transfusions, dying from pulmonary edema with unperceptible blood pressure and gasping respiration. It shocked patients do not respond to therapy in a few hours, immediate surgery is mandatory. Gas gangrene increases shock, and may be the only clinically diagnosed cause of shock. Sudden warming of a patient in cold weather may increase shock.

Another group of patients showed severe shock without adequate hemorrhage or clinical gas gangrene. It is suggested that these cases should be treated as if they suffered from anaerobic infection. Gas gangrene antitoxin was disappointing and resulted in three fatal reactions. When amputation is certainly necessary, a tourniquet should be applied below the level of anticipated amputation as soon as the decision is made.

Regarding priority for operation, the few patients with extremity wounds whose response to shock therapy was poor were placed below those with continuing concealed hemorrhage or insurmountable mechanical impediments to respiration, but above those with abdominal, thoracic abdominal or chest injuries. The vast majority of patients with shock due to extremity wounds required surgery less urgently than any of those emergencies mentioned. BURNS PLEWIS

**A Study in Intravascular Thrombosis with Some New Conceptions of the Mechanism of Coagulation.** Cummine, H and Lyons, R N.: *Brit J. Surg.*, 35: 22, 1948

In a study of the factors contributing to thrombosis from Australia, theories of etiology and details of treatment and prophylaxis are presented. Much work was done in Sydney from which tables and case reports illustrate the argument. It is stated that pulmonary thrombosis is much more common than formerly believed, and that it may be acute or chronic. Prophylactic vein ligation is not considered of proved benefit, but the conservative measures of early ambulation, active movements in bed are advocated. The use of heparin and dicoumarol is advised under certain circumstances. The prethrombotic state can be detected by routine postoperative coagulation graphs, and such cases (3 to 5%) should receive immediate anticoagulant therapy. The simple capillary tube method of measuring coagulation time was shown to be just as effective as the Bergquist method, if certain rules are followed.

A conception of the mechanism of intravascular clotting is presented. This involves a variation, an abnormality, fibrinogen B, the tests for the presence of which are described. Thrombosis may also occur after a long operation through the production of excessive amounts of thrombin. Infection and venous stasis were found to be precipitating factors in intravascular throm-

bosis when free fibrinogen B was found to occur in the plasma and coagulation times remain at low levels. Details of the prophylactic and therapeutic management of intravascular thrombosis are given. Heparin is given intravenously every four hours. Dicoumarol dosage is discussed. BURNS PLEWIS

**The Surgery of Duodenal Ulcer.** Wells, C and Brewer A C.: *Brit. J. Surg.*, 35: 364, 1948

The indications for subtotal gastrectomy for duodenal ulcer perhaps the most satisfactory of the routine operations in surgery, are enumerated. Pyloric stenosis due to ulcer is often hard to tell from carcinoma of the antrum and any serious delay in stomach emptying calls for gastrectomy. The operation should be advised after two perforations. Since the operative mortality is very low in capable hands, failure of non operative measures should be an indication for operation. People with certain occupations such as a seafarer, or whose life prevents successful medical measures to control their ulcer may be well advised to have surgery. No patient should be refused because of old age. The anaesthetic agent favoured is curare and pentothal.

The technique of operation is discussed. The pyloric antrum must be removed and non-absorbable sutures used to invert the duodenal stump. It dissection of the duodenum is very difficult a two-stage operation may be wise. It is recommended that the resection of the stomach be very high, that the anastomosis be antecolic with the afferent jejunal loop to the lesser curve and that the lesser curve side of the stomach division be partially closed to prevent dumping. The Bincroft procedure of leaving the antrum after removal of its mucosa is not approved. The incision is transverse or a double Kocher. Early postoperative care is described with elevation of the foot of the bed and exercises and early ambulation. No cases of macrocytic anaemia were encountered.

The conclusions are based on 363 cases operated upon. After subtotal gastrectomy the results are nearly 100% satisfactory. BURNS PLEWIS

## Obstetrics and Gynæcology

**Bacterial Flora in Infants Encountered at the Time of Delivery.** Franklin, H C.: *Am J Obst & Gyn.*, 56: 738, 1948

One hundred cultures were taken from the external surface of the eyelids of newborn infants immediately after birth and before the cord was cut. Ninety six per cent of the cultures were positive, and from one to four organisms were isolated in each positive culture. A total of 167 organisms were identified, of which staphylococci, *E. coli*, and streptococci were predominant. ROSS MITCHELL

**Gynæcologic Surgery in the Elderly with Special Reference to Risks and Results.** Leman, F. D. and David, A M.: *Am J. Obst & Gyn.*, 56: 440, 1948

The increasing numbers of elderly women presenting a variety of gynæcologic disorders bring new responsibilities to the gynæcologist and to the internist. This study of 202 cases of women over sixty years of age who were subjected to 217 surgical procedures, with only two deaths, indicates that the range of surgery may be safely extended for this age group. Careful preoperative studies of these patients by the team of gynæcologists and internist sharply limited the operative risk. These elderly women presented a variety of systemic conditions, associated with the local lesions. The implications of hypertension, arteriosclerotic heart disease, anaemia, diabetes and malnutrition have been discussed in relation to the determination of surgical risk. Modern methods of anaesthesia, liberal use of whole blood, transfusions, early rising, the use of chemotherapy, and antibiotics

prevented or modified complications of the postoperative period. In general the authors believe that the careful evaluation of the functional capacity of older individuals will eliminate false emphasis on chronological age, and thus point the way to successful therapy.

ROSS MITCHELL

#### Gynatresia: Report of Three Uncommon Clinical Types.

Maliphant, R. G.: *Brit. M. J.*, 2: 555, 1948.

Three unusual types of gynatresia with certain features in common are described. Failure of canalization was limited in extent and localized to the cervical or vaginal segments of the Mullerian tract, and the symptomatology was dependent upon the presence of a functioning uterus. Two were examples of hæmatometra due to atresia at the level of the cervix, and the third was a case of hydrocolpos, a condition in which an accumulation of watery or mucoid fluid in the vagina may produce serious mechanical effects during infancy and childhood.

The three abnormalities were congenital atresia of the cervix with hæmatometria in atresic horn of uterus bicornis unicollis, and hydrocolpos in infancy. Each had distinctive clinical features and they were amenable to conservative treatment. Developmental anomalies of this order, though rare, are of much practical interest, for unless recognized they may be submitted to needlessly radical operative procedures.

ROSS MITCHELL

#### The Present Position of Neurosurgery in Gynæcology.

Davis, A.: *Brit. M. J.*, 2: 585, 1948.

Resection of the presacral nerve, ovarian sympathectomy, alcohol injection of the pelvic plexus, intrathecal alcohol injection, intraspinal sulphate injection, epidural block, paravertebral block and cordotomy are described and the indications for their use are given. The author states that there is no doubt of the permanent value of these procedures. They are themselves easy of performance, the secret lies in careful case selection. Given this, and the equally careful application of the appropriate operation, the great majority of cases of pelvic pain can be adequately relieved in one way or another, and it is more than justifiable to give these patients the benefit of such relief. Too many women suffer from much unnecessary pain, and the results from sympathectomy are now good enough to warrant its more extended application.

ROSS MITCHELL

#### Erythrocyte Sedimentation Velocity in Normal Pregnancy.

Obermer, E.: *J. Obst. & Gyn. Brit. Emp.*, 55: 468, 1948.

The figures show: (a) That in the majority of normal pregnant women sedimentation velocity increases slightly as early as the 5th or 6th week. (b) That from the 8th week onwards there is a regular increase in the velocity, up to a maximum at the 40th week. (c) That after labour the velocity falls steeply; in 4 weeks to almost normal limits and by 8 weeks to the normal limits—for the non-pregnant state.

P. J. KEARNS

#### Heart Disease in Pregnancy.

MacRae, D. J.: *J. Obst. & Gyn. Brit. Emp.*, 55: 197, 1948.

In the review of 29,713 patients who attended Queen Charlotte's Maternity Hospital during the decade 1937 to 1946 the total number with heart disease was 225, an incidence of 0.8%. Thirteen of the patients had congenital heart lesions, and a definite history of rheumatic heart disease was obtained in 91.5% of the remainder. The maternal mortality rate in the series was 3.1%. The stillbirth rate was 3%, corrected to 1%, and the neonatal death rate was 2%. Therapeutic abortion is advised for patients in Groups III and IV who do not

improve in early pregnancy, and for those seen at this time with auricular fibrillation, or who give a history of previous heart failure. Vaginal delivery is considered best for patients with heart disease in the absence of any other complications. Caesarean section has however a definite place where dystocia is anticipated. The dangers of prolonged labour and accouchement force in heart disease are also emphasized. The patients in this series who died were all primigravidae; and it was noted that out of 131 primigravidae 9.9% were in Group IV, and out of 81 multiparae only 4.9% were in Group IV.

P. J. KEARNS

#### Inactivation of Œstrogenic Hormone by Women with Vitamin B Deficiency.

Zondek, B. and Brzezinski, A.: *J. Obst. & Gyn. Brit. Emp.*, 55: 273, 1948.

Inactivation of endogenous and exogenous Œstrogen remains unimpaired in vitamin B deficiency. This is proved by the following findings: (a) No clinical symptoms of hyperœstrinism (e.g., enlarged uterus, cystic mastitis, etc.) were observed. (b) Vaginal smears were normal. (c) Biopsies of the endometrium taken before menstruation showed a normal progestative phase. (d) Œstrogen titres in the blood and urine were normal. (e) Œstrone, injected for an œstrone clearance test, was inactivated in a normal manner. Pregnant women suffering from vitamin B deficiency showed no impairment of Œstrogen inactivation and this holds true even when their liver function was otherwise damaged by concurrent infectious hepatitis. Since no changes in Œstrogen inactivation were observed in women suffering from severe vitamin B deficiency, the vitamin seems not to be an essential factor in the Œstrogen inactivation mechanism.

P. J. KEARNS

#### Relief of Severe Stress Incontinence.

Marshall, C. M.: *J. Obst. & Gyn. Brit. Emp.*, 55: 133, 1948.

The above descriptions are founded on an experience of 25 sling operations (October, 1947), the majority being of the types described. The results have been eminently satisfactory on the whole, but it is felt that a detailed account of these should be withheld until the numbers have increased and further time has elapsed. There has been only one complete failure. In another the indications were stretched to include stress incontinence and nocturnal enuresis; the former was largely relieved but the operation failed to cure the latter. In 2 other patients the fault has lain in over-correction; for the stress incontinence difficulty in micturition has been substituted; but now, some 6 months later, both these patients are improving.

P. J. KEARNS

#### Virilizing Tumours of the Ovary.

Searle, W. N.: *J. Obst. & Gyn. Brit. Emp.*, 55: 141, 1948.

An account is given of a case of virilism in pregnancy. Masculine features included change in the voice and hirsuties. Acne and hypertension were present. Lactation was not established. There was no polycythæmia, obesity, headache, diabetes or enlargement of the clitoris. The successful removal of a virilizing tumour of the ovary is described. The pathology of the ovarian cyst is described together with an account of some endocrine considerations. The tumour is composed of a loose, connective tissue ground-work in which are set irregular sheets or masses of polyhedral cells. Blood vessels are frequent. Many have relatively thick walls, but often tumour cells are separated from the lumen only by a single endothelial layer. There are several small areas of lymphocytes. The tumour cells resemble those of the adrenal cortex. The size of the cells varies from 5 to 60  $\mu$  but the average size ranges from 5 to 20  $\mu$ .

P. J. KEARNS

## Industrial Medicine

### Acceptance of Ultraviolet Lamps for Disinfecting Purposes. *J. Am. M. Ass.*, 137: 1600, 1948.

Recent advertising literature and reports, issued by manufacturers, indicate that the use of ultraviolet lamps for disinfecting purposes is proposed for a wide range of applications—sterilizing of dishes and other solid objects, disinfection of air, irradiation of beverages, and, for the dairy and poultry industry. In this article the Council on Physical Medicine analyzes these proposed applications and presents its opinion as to the usefulness of each. It considers the probable degree of effectiveness that may be expected in the various applications and presents a statement of the specific applications that appear to fall within the purview of the Council. This report adopted by the Council is a revision of their statement of 1943.

In addition to the analysis of the present status of the proposed use of ultraviolet and physical data on the lamps, it outlines the Council's statement on "Requirements for Acceptance of Ultraviolet Lamps for Disinfecting Air". They reaffirm their former decision to accept ultraviolet lamp devices only as adjuvants or supplements to other methods of disinfecting air in hospitals, nurseries and operating rooms, where the population can be controlled.

Recognizing the deleterious effects of ozone generated by ultraviolet lamps, the Council requires for acceptability of ultraviolet disinfecting lamps, that, under suitable ventilation, in the space near the occupants of the room the concentration of ozone shall not exceed 1 part in 10,000,000. This specification is tentative, awaiting confirmation of evidence that a lower concentration is desirable in nurseries and hospital rooms occupied 24 hours a day. Of the two kinds of ultraviolet disinfecting lamps now manufactured, the Council accepts only the type "L" lamp; this type generates a low amount of ozone.

In order to maintain an ultraviolet output above the minimum value for adequate disinfection, the Council recommends that the ultraviolet intensity of each lamp unit be measured at least once a month. The ultraviolet spectral energy distribution of the disinfecting lamp shall be comparable in lethal effectiveness with the low vapour pressure mercury discharge tube in which the dominant radiation is of wavelength 2,537Å. The minimum intensity at right angles to and at a distance of 1 metre from the plane of the lamp tube in its fixture shall not be less than the germicidal equivalent of 20 micro-watts per square centimetre of homogeneous radiation of wavelength 2,537Å. The useful life of the lamp shall not be less than 4,000 hours.

Rules are outlined which a manufacturer must follow when submitting lamps for consideration of acceptance by the Council. Under the Council's rules its acceptance of any device may not be used to promote the sale of such device for uses that are not specifically indicated by the Council's acceptance.

MARGARET H. WILTON

## Dermatology

### Chemosurgical Treatment of Cancer of the Skin. A Microscopically Controlled Method of Excision. Mohs, F. E.: *J. Am. M. Ass.*, 138: 564, 1948.

This method of treatment for cancer of the skin, except for orificial lesions, consists essentially in chemical fixation *in situ* of suspected cancerous tissue by means of a zinc chloride paste and successive excisions of the fixed tissue in a plane parallel to the surface, which is examined microscopically to locate precisely the cancerous areas, until by repetition of these alternating procedures the cancer is entirely excised. The termination is indicated when the final layer of fixed tissue excised shows entire absence of cancer structure. After the first excision subsequent application of the

fixative is limited to the areas still cancerous as mapped out in positions comparable to their position on the tissue excised. The slight pain is readily controlled by an acetylsalicylic acid and codeine-containing analgesic. The procedure is repeated daily, the fixative being allowed to act through the 24-hour period intervening between one excision and the next. The total time necessary varies according to the thickness of the dermis, from 3 days for the eyelid to as much as 10 days for the back. In 458 cases of basal cell carcinoma of the skin followed for 3 years the rate of cure was 97.4% and in 291 cases followed for 5 years the rate of cure was 96.2%. Extensiveness *per se* is not a contraindication factor in basal cell carcinoma unless some vital structure such as brain, carotid artery or jugular vein has been invaded. The method is particularly valuable for recurrent lesions previously treated by surgery or radiation singly or in combination. The highly invasive, recurrent type of lesion is a prime indication for the chemosurgical technique because the microscopic control makes it possible to follow out each of the deeply permeating radicles which characterize such cancers. In squamous cell carcinoma of the skin 222 cases followed for a three year period gave a rate of cure of 53.6%, while in 136 cases followed for 5 years the rate of cure was 54.4%. The writer claims for the chemosurgical method, which he has been carrying out at the University of Wisconsin Medical School and Hospitals for over 8 years, a higher degree of reliability than that reported with statistical validity for radiotherapeutic measures at other centres such as the Radiumhemmet in Stockholm, the Norwegian Radium Hospital and the Huntington Hospital in Boston. The method is the reverse of radical since by reason of the constant microscopic control of the excision only 1 or 2 cm. beyond the actual cancerous involvement at any one point need be removed, and many of the author's cases were so extensive that only orthodox surgical methods could have been considered, and indeed some would have been deemed inoperable. Employment of the method requires a certain amount of training and experience, and facilities for preparation of frozen sections, with the services of technical assistants trained in handling specimens of fixed tissue.

D. E. H. CLEVELAND

### Disseminated Lupus Erythematosus Occurring Among Student Nurses. Ayyazian, L. F. and Badger, T. L.: *New England J. Med.*, 239: 565, 1948.

In the course of a follow-up survey on a group of 750 nurses in a large hospital over a 13-year period it was found that 23% of the total mortality was accounted for by disseminated lupus erythematosus, the disease being second only to tuberculosis as the major cause of death. In an attempt to account for this curious and unexpected finding, the impossibility of comparison with causes of death in the general population, due to the existence of several artificial factors is recognized, but a search for a factor common to the 3 cases concerned appears to throw some light on the modern concepts of the pathogenesis and etiology of the disease. It is generally considered that the etiologic factors are multiple, and it is assumed that they are of the nature of tissue sensitization to and destruction by various bacteria or toxins and there is agreement with Bloch's dictum that "the type and course of the allergic reaction are independent of the nature of the antigen, but vary according to the localization of the antibody, that is, according to which organ reacts to the antigen." Beside the bacterial organisms, most frequently streptococcus, incriminated, among non-bacterial agents horse serum, as employed in prophylactic procedures has received some consideration. The pathology of the disease, widespread fibrinoid degeneration of collagen, is that considered also to be the pathology of hypersensitivity and hyperergic inflammation, the fatal outcome of the disease being attributed to the pronounced necrotic

reactions of these allergic processes in other words a generalized expression of the Arthus phenomenon. In connection with the almost exclusive occurrence of the disease in females between puberty and menopause it is suggested that a hormonal factor may operate, paralleled by the case with which the Schwartzman phenomenon may be induced in the pregnant laboratory animal. Other observations cited in this regard are the low excretion of the 17 ketosteroids in the rare male afflicted with disseminate lupus erythematosus, the high follicle stimulating hormone, premenstrual excitation and improvement following natural or induced menopause. The case for streptococcus as one of the sources of the antigen, apparently more frequently in England as claimed by Barber and others, is discussed, and in the first of the 3 cases described in great detail by the author there was a close association between reactions to streptococcus toxins administered prophylactically and the onset of the disease. In each of the 3 cases in allergin could be traced as a possible causative factor. In the second case the disease appeared a few months after a series of inoculations with scarlet fever streptococcus toxin. In the third case the first cutaneous symptoms appeared months after typhoid vaccination and death followed in 11 months. The authors consider that an antigen in the form of a bacterial product may have been supplied in all three cases, and this is compatible with the views of a non specific sensitivity as the pathogenesis of the disease being allergic. If the local and systemic reactions to the Dick toxin possess a denominator in common with the so called diseases of allergy and hypersensitivity, it seems possible that there is a point at which the systemic effect of the antigen antibody reaction becomes irreversible and the disease progresses even if the antigen is removed. In cases occurring among the general population a constantly present or frequently recurring obscure infection might render the patient sensitive and from there on supply a bacterial antigen to supply a series of bodily reactions similar to those supposedly supplied by the inoculations in the 3 cases described.

D. E. H. CLEVELAND

**Streptomycin in Topical Therapy. I. Its Sensitizing Property.** Goldman, L. and Feldman, M. D.: *J. Am. M. Ass.* 138: 641, 1948.

In a series of about 300 cases of pyogenic skin infection in which the authors used streptomycin ointment successfully only 3 cases of eczematous contact hypersensitivity occurred. The suspected cause of the reaction was verified by patch test. The authors believe, as a result of this clinical investigation as well as a small series of patch tests on skin (face) and mucous membrane (vagina), that streptomycin is a poor sensitizing agent and perhaps much less active than penicillin. The types of infection successfully treated included impetigo, pustular folliculitis, ecthyma and non fungous otitis externa. Among other advantages over penicillin, assuming that the evidence derived from this preliminary investigation is corroborated is the fact that subsequent parenteral use of streptomycin is less likely to be employed than would be the case with penicillin.

D. E. H. CLEVELAND

**The Healing of Resistant Skin Ulcers After Treatment with Nitrogen Mustard.** Aleksandrowicz, J.: *Am. J. M. Sc.* 216: 275, 1948.

This preliminary report from the II Medical Clinic of the Jagiellon in University of Cracow, deals in particular with a very large and deep ulcer of the groin which resulted from postoperative radiation for carcinoma of the penis. The drug was administered intravenously, daily for 6 days, then in two series of injections at 6 week intervals of 3 and 2 injections respectively. Pain was relieved quickly, granulation tissue and a contraction of the ulcer developed rapidly and in 2 months the ulcer healed to skin level, and the ulcer, much reduced in size, was partially epithelialized. Sensitivity to nitro-

gen mustard is tested by the author before therapeutic use by application of various concentrations of an alcoholic solution to the skin, and the intravenous dose which may be employed is determined by the degree of the reaction. Favourable results in superficial decubitus ulcers as well as deep ulcers following x-ray burns have been observed in other cases.

D. E. H. CLEVELAND

**The Use of Brilliant Green in the Treatment of Chronic Ulcers of the Skin.** Fineberg, A. W.: *New England J. Med.* 239: 613, 1948.

Although it has been reported that the aqueous solution is unstable Fineberg has not found this to be true, stock aqueous solution giving excellent clinical results months after their preparation. This preliminary report deals with its uniformly successful results in over 20 cases of chronic ulceration of the skin. It was employed in 2% solution in distilled water, and painted on the ulcer which had been cleaned with hydrogen peroxide and alcohol daily. Healing generally took from 7 to 10 days. A dry sterile dressing was applied after the painting. No irritation from the brilliant green was observed.

D. E. H. CLEVELAND

**Treatment of Scabies. Report of One Hundred Patients Treated with Hexachlorocyclohexane in a Vanishing Cream Base.** Cannon, A. and McRae, M. E.: *J. Am. M. Ass.* 138: 557, 1948.

The authors briefly review the recent history of scabies, its diagnosis and methods of treatment. Benzyl benzoate, the most recent and widely popular remedy, is not without its objectionable features, such as frequent burning on application, and irritation and sensitivity appearing later. Hexachlorocyclohexane, not to be confused with benzene hexachloride, the distinction being readily apparent on examination of its graphic formula, has been found, in the form of its gamma isomer, an efficient miticide and insecticide, being toxic to all animal parasites on the human body, including the *Acarus scabiei*. It is employed against scabies in a 1% concentration in a vanishing cream base. The cream is rubbed in without a preliminary bath, and the patient is required to refrain from bathing or washing the hands for 24 hours; 61% of the cases were cured after a single application, 36% required two, and 3% required a third application. All were cured. The treatment was used in both adults and children, but there was not a single instance of irritation produced, even in some cases in which there was extensive eczematization from scratching. The preparation produced no staining of clothing and bed linen and was cosmetically acceptable.

D. E. H. CLEVELAND

## OBITUARIES

**Dr. Antonio Bellerose** died suddenly on October 27, only a few hours after he had realized his life's ambition, to be appointed chief surgeon of Notre Dame Hospital, Montreal. He was 56 years old. Born at St Philippe de Valois he attended Joliette Seminary and the University of Montreal. He took up postgraduate courses in surgery in Paris in 1919 and 1920. He returned to Canada in 1921. He was a life governor of Notre Dame Hospital; Fellow of the Royal College of Physicians and Surgeons of Canada, member of La Société Médicale de Montréal and other medical organizations. He is survived by his widow, one son, one daughter, two sisters and two brothers.

**Dr. Allan Walker Blair** died suddenly of a heart attack on November 9 at his home in Regina. He was director of Saskatchewan cancer services and clinical director of the Regina cancer clinic. Born in Brussels, Ont., on November 28, 1900, he moved with his family

to Regina in 1911 and attended Victoria school and Central collegiate. He graduated from the University of Saskatchewan with his bachelor of arts degree in 1924, and in 1928 graduated in medicine from McGill university. He spent a year as resident surgeon at Winnipeg General Hospital and then was for two years on the staff of New York Memorial Hospital. There followed five years on the medical staff of the University of Alabama and concentrated postgraduate studies on cancer in the United States, Great Britain, France, Belgium, Germany and Sweden. He continued specializing in cancer when he accepted the post of associate director of the Toronto Institute of Radiotherapy at Toronto General Hospital. He held this post until May, 1939, when he went to Regina.

He is survived by his widow, two daughters, one son, his mother and two brothers.

**Dr. John Weightman Bridge**, Chief Coroner for Alberta, died November 4 in Edmonton. He was 44 years old. Born at Vancouver, he attended public and high schools in that city prior to attending the University of British Columbia where he graduated in arts. Later he took his medical course at the University of Alberta graduating in 1932. He completed his internship of three years at the University hospital after which he practised for several years at Edson. Following the outbreak of war in 1939, Dr. Bridge joined the Fourth Casualty Clearing Station, R.C.A.M.C. and went overseas with that unit in January 1940. He was awarded the M.B.E. in 1943 in recognition of his services. Since his return from overseas in 1946 he had practised in Edmonton and in 1947, was made a Fellow of the Royal College of Surgeons of Canada. Dr. Bridge is survived by his widow, a daughter and a sister.

**Dr. James Dunbar Duncan** of Leask, Sask., died in the hospital at Prince Albert at the age of 76 years. He had practised at Leask for thirty-seven years. Graduating from the University of Manitoba in 1898, he did postgraduate work in London and Scotland before establishing a practice at Roland, Man. He moved later to Crystal City, Man., before going to Leask, Sask., in 1911 as doctor for the Indian Affairs Department. Born at Scarborough, Ontario, he moved with his parents to Morden, Manitoba. Although he was 76 years old it was only this winter that he made any concession to his age when he decided he would undertake no more "night" calls. He is survived by two sons, three brothers, and four sisters.

**Dr. George W. T. Farish** of Yarmouth, N.S., died November 19 at the age of eighty-six, after a long period of illness. Born at Liverpool, N.S., the son of Dr. Henry Greggs Farish, he graduated from Jefferson Medical College, Philadelphia in 1886 winning the Gold Medal in Surgery. Following graduation he practised with his father in Liverpool for a short period before going to Yarmouth. He retired from active practice in 1945 with an unbroken line of 140 years behind him during which succeeding Farishes had practiced medicine in Nova Scotia. Besides attending to an active practice he took part in many community efforts in Yarmouth.

**Dr. George A. Hall**, aged 80, died at Nanaimo, B.C., on November 5. He was born in Ontario, and went to Vancouver Island with his parents when seven years old, settling at Westholme. He was one of the few men in British Columbia who has graduated in both dentistry and medicine. He attended the Old Boys' School in Victoria and graduated in dentistry in Philadelphia, opening an office in Nanaimo. In 1896 he graduated in medicine from the Cooper Medical College, now Stanford University. Dr. Hall practised in Nelson, and became Liberal member of the Provincial Legislature for that constituency. In 1908 he moved to Victoria where he

acted as city health officer until 1917. During the Great War he became a Major in the Canadian Corps.

Dr. Hall came to Nanaimo in 1921, organized the Nanaimo Medical Clinic and practised medicine there until his retirement in 1940. Thereafter he lived for a time in Victoria again, when he served on the School Board and was candidate for mayor in 1943. He was prominent in Liberal circles and held high honours in the Masonic Order. Three sons, all physicians, survive: Dr. Norman C. Hall, Phoenix, Ariz.; Dr. Earl Hall, Vancouver, and Dr. Alan Hall, Nanaimo.

**Dr. W. H. Irvine** died at his home in Fredericton recently after a long period of indifferent health. Dr. Irvine was one of the older practitioners in Fredericton and will be remembered as a prolific writer on many subjects. He graduated from Bellevue Hospital Medical College in 1893.

**Dr. Angus Dougald MacIntyre** died recently in Spokane, Washington. Born in Glencoe, Ont. in 1877 he was a graduate of Queen's University School of Medicine. After his graduation, he took over his father's practice in Glencoe, later going to Petrolia, and from there to the superintendency of Kingston General Hospital. In 1909 he moved west to Spokane. About ten years ago he became a director of the Medical Service Bureau, and was also president of the Spokane County Medical Society. He was a Fellow of the Royal College of Surgeons of Edinburgh, Scotland, and also a member of the Manito Lodge No. 246 A.F. & A.M. and Manito Presbyterian Church. Surviving are his widow, one son and a sister.

**Dr. George Lloyd McKee** died in Montreal, on November 5 after a brief illness. He was born at Coaticook 82 years ago and took a pharmacy course at Laval University and graduated in medicine from McGill University in 1890. He practised in the Eastern Townships at Danville and Compton, and also for a short time in New York. He came to live in Montreal in 1915 and some time later gave up the practice of medicine and entered the service of the Federal Government in the Income Tax Department, where he remained until 10 years ago, when he retired. Surviving are one daughter, three grandchildren and one sister.

**Dr. Archibald Edward Mackenzie**, 55-year-old anaesthetist specialist, and medical health officer for suburban Stamford Township, died on November 20. He was born in Oil City, Pa., and came to Canada in 1911, to attend the University of Toronto, where he received his M.B. degree. He enlisted in the Canadian artillery as a gunner and served overseas in 1915 and 1916. He returned to the university to graduate in 1917, and then re-enlisted in the C.A.M.C. with the rank of lieutenant and went back overseas. He was promoted to captain and joined the staff of No. 3 General Hospital. Dr. Mackenzie saw service with the R.C.A.M.C. from August, 1941, to June, 1946, in military hospitals at Halifax, N.S., and Hamilton, and on the hospital ship *Letitia*, making numerous trips from Great Britain, France and Manila with wounded troops. He was promoted to the rank of major.

Dr. Mackenzie was a member of the Greater Niagara Hospital Trust, a director of the Greater Niagara Community Chest, a past president of the Niagara Falls Kiwanis Club, and a director, and a former lieutenant-governor of Quebec-Ontario district of Kiwanis International. He was a 32nd degree Mason, past master of Stamford Lodge, No. 626, A.F. and A.M., past T.P.G.M. Elgin Lodge of Perfection, and a member of Moore Sovereign Consistory, Scottish Rite, Hamilton. He was a member of First United Church in Stamford, and was an elder and a trustee. For many years he was superintendent of the Sunday School. Surviving are his widow and three sons.

**Dr. John D. McQueen**

## AN APPRECIATION

The passing of Dr. John D. McQueen has taken from Manitoba's medical profession one of its most valued members and from its people one of its most respected citizens. Amongst his outstanding personal characteristics were an unchallenged honesty and integrity, uprightness and charitableness, firm sympathy and quiet, shrewd, boyish sense of humour.

It was the writer's good fortune to have spent eight years in close association with J. D. McQueen in university and hospital teaching and it can be said without fear of contradiction that he was unequalled in his ability in demonstrating and instructing gynaecology to over a score of graduating classes in medicine. He never forgot the student in his enthusiasm of teaching and was ever conscious of the students' difficulties. His methods were direct, simple, and to-the-point. His good common sense in all things and his superior clinical judgment were evident in both his teaching and practice. As a gynaecological diagnostician he was an acknowledged leader in Western Canada. It was a revelation to those of us who were his students and assistants to witness a pelvic examination performed by him. Gentle, patient, thorough and systematic in execution, he permitted no prejudices to warp or falsify his objective findings. He always taught and practised the importance of committing oneself on paper to a diagnosis, right or wrong though it might be, as he sincerely believed that only in this way could one's diagnostic "batting average" be improved.

Although others may have possessed greater speed and polish in operative work, his technique was beyond reproach; careful and meticulous to a fault, he revealed a tremendous respect for blood loss and avoidance of trauma in his operations, concrete criteria characteristic of all good surgeons. Although, compared with many, his indications for surgery were strict and conservative, nevertheless he never failed to act quickly and decisively when the patient's condition or disease warned of danger or disaster. Amongst his many contributions to medical practice in this community, the greatest was his tireless and enthusiastic study, treatment, and follow-up of hundreds of cases of pelvic malignancy. He had no peer in this field and his results published and unpublished were equal to any of those reported elsewhere.

He was a voracious reader of both scientific and fictional works, and the writer recalls many a pleasant evening with him in his home before his fireplace discussing the events of the day, politics, a new novel or a biography. One of his great pleasures in his latter years was football, although he was interested in and ardently supported other community sports. But at Osborne Stadium on a crisp autumn Saturday he could be seen as one of the most active and spirited fans ever cheering, ever faithful to his beloved Blue Bombers. As expected, he bore his final illnesses with courage, dignity and cheerfulness.

To his loving and devoted widow and daughter goes out the deepest sympathy of the medical profession of Canada.

BRIAN D. BEST

**Dr. W. M. Minto** died suddenly in Montreal on October 17. He was in his 56th year. Born in Sunderland, England, Dr. Minto came to Canada in 1910 and began his study of x-ray in the Montreal General Hospital. After spending 16 years there he resigned in order to start his private laboratory. He was a graduate of the University of Montreal. He was an active member of the Thistle Curling Club and was honorary secretary-treasurer of the old St. Lawrence Curling Club. Surviving are his widow, one daughter and one brother.

**Dr. Campbell Hamilton Monro**, who practised for many years in St. James, died on November 20, aged 80. His death removes a link with the early history of this

country, as his great-grandfather was Sir Alexander MacKenzie who discovered the river of that name and made the famous overland trip to the Pacific in 1793. Dr. Monro was also a direct descendant of the House of Clan Monro. Born at Walthamstow, England, he was educated at Cliff College, then graduated in theology at Cambridge University. He came to Canada in 1898 as a missionary for the Presbyterian Church, served for two years on the Indian reserve at Qu'Appelle, then ministered for twelve years to the new settlers at Ethelbert, mainly from the Ukraine. He came to Winnipeg to study medicine and graduated from Manitoba Medical College in 1913. From that time he practised at St. James in Greater Winnipeg until his death. He is survived by his widow and three sons. Of a studious and retiring disposition, he was not widely known, but he was held in high esteem by his patients and friends.

**Dr. Geraldine Oakley**, a resident of Calgary and doctor in charge of school children here since 1912, died November 5. Born in Stratford she received her education in Ontario, graduating in medicine from the University of Toronto. She opened the Women's College Hospital in Toronto shortly before moving to Calgary 36 years ago. Upon arrival here Dr. Oakley was employed by the Calgary School Board, in charge of the health of Calgary school children.

About 20 years later Dr. Oakley was made Assistant Medical Officer. She had operated the baby clinic at the City Hall for a number of years, and had been associated with Dr. W. H. Hill, medical officer, in regard to public health generally. Surviving are her sister and one brother.

**Dr. William C. Toll** of Toronto, died on November 19, 1948 at Monessen, Penn.

**Dr. Helen Louise Vanderveer** died at Kingston, Ont., on November 11, 1948.

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**NEWS ITEMS****Alberta**

**Dr. Harry Ostry** of Calgary has recently been made a member of the British Association of Urological Surgeons. Dr. Ostry is associated with the Colonel Belcher Hospital.

**Dr. E. B. Quehl** of Edmonton is taking a year in gynaecology and obstetrics in London, England and will return to Edmonton to continue his private practice.

**Dr. Arthur A. Haig** of Lethbridge has returned from Edinburgh following six months of postgraduate work and while there he was made a Fellow of the Royal College of Surgeons of Edinburgh.

The Biglow-Fowler Clinic of Lethbridge occupies a most up-to-date building in that city and new members have been added in recent months.

**Dr. H. B. Hunt** of Lethbridge has returned from nine months' postgraduate work in Edinburgh and while there Dr. Hunt was made a Fellow of the Royal College of Surgeons of Edinburgh.

**Dr. Eddie Cairns** is doing postgraduate work in paediatrics in Boston and will be returning to continue his specialty in the beginning of the New Year.

In the recent examinations of Certification by the Royal College of Physicians and Surgeons of Canada the following candidates from Edmonton were successful: In Anaesthesia, Drs. Nelson W. Nix; E. A. Gain; C.



Learmonth; O Stechyshin and M Yates. In Radiology, Dr Allan McCurragh. In Obstetrics and Gynaecology, Dr D Buchanan. In Dermatology, Dr. Paul Rentier.

In the recent examinations held by the Royal College of Physicians and Surgeons of Canada for the Fellowship the following candidates from Alberta were successful. In Surgery, Dr O Rostrup (Orthopaedic), Drs Carmen Weder and W C McKenzie (Surgery), Dr George P. Fortier (Gynaecology and Obstetrics), Dr R M Wice'er, Chas Allard, James Sinclair and Leonard B Pratham (Medicine).

Dr R C Riley of Calgary has returned from one month's tour of the American centres for cancer and cancer research. While away Dr Riley reviewed the latest procedures carried out for cancer treatment and investigation. Dr Riley is Director of the Cancer Diagnostic Clinic in Calgary.

Dr. Graham Hutchell of Edmonton has been appointed Professor of Orthopaedic Surgery at the University of Alberta following the retirement of Dr H H Mewburn who has held that position for many years and who has since retired from this post. Dr Mewburn is carrying on his private practice in Edmonton.

The addition to the University Hospital is well under way and because of the very fine Fall in Alberta many of the other units have progressed on the University campus.

W CARLTON WHITESIDE

## British Columbia

The Vancouver Medical Association is celebrating its Golden Jubilee this year. Founded in 1898, by the few medical men then practising in Vancouver, it has grown steadily in its fifty years, to a membership of five hundred. A few of the earlier members are still with us—Dr Glenn Campbell, Dr. William D Keith (who was one of the original members), and one or two others who are no longer in active practice.

A dinner is being held to commemorate the event on December 7 at the Hotel Vancouver. This will be the occasion of the inauguration of the John Mawer Pearson Memorial Lecture. A fund was established some years ago in memory of Dr. J. M Pearson, one of the founders of the Vancouver Medical Association, and the man to whom, perhaps more than any other man, the Association owes its survival in its first difficult days. He was the leader in the establishment of the Medical Library, the first Editor of the *Bulletin*, and an active leader in all that made for unity and growth in the profession.

The first Pearson Memorial Lecturer will be Dr. J. S L Browne, Professor of Medical Research of McGill University.

The beginning of 1949 is being awaited with various degrees of anxiety and interest by the medical profession of British Columbia, since the Hospitalization Act of British Columbia comes into force on January 1. Just what will happen is the question in which we are all interested. A great deal of work is being postponed, wherever at all possible, till hospital treatment shall be come free—and since, even under present conditions, hospital accommodation, at least in the cities of Vancouver, New Westminster, and to a lesser degree Victoria, is woefully short, there is considerable apprehension as to what will be done to meet the demand, which will certainly be heavy.

A Vancouver citizen has declared his intention to refuse the payment of his dues, which by law every citizen must pay, under penalty for non payment. This on the ground that there is no guarantee that if he needs a hospital bed, he can obtain one. The Minister in charge of the administration of the Act has pointed out that the Government does not guarantee accom-

modation, but merely payment of any hospital charges that may confront any citizen.

The attitude of the medical profession is that it intends to co operate to the full extent of its powers in the operation of the Act, but it is in no way responsible for any difficulties that may arise, since it was not consulted at all before the Act was framed.

A hospital survey is under way in British Columbia and especially in the lower mainland area including Vancouver, Burnaby and New Westminster. The latest information is that two major projects will soon be put into active form; the extension of the Vancouver General Hospital by some eight hundred beds, and the building of a hospital for convalescent or chronic cases to relieve the active treatment wards of the General Hospital.

There has also been talk of the building of a new hospital in Burnaby, but all these projects are some what threatened by the difficulty in obtaining material especially steel.

A small town, Alert Bay, situated on an island just north of the northern extremity of Vancouver Island has recently come into notice, on account of the enlargement of a small hospital that has been there for many years operated by the Columbia Coast Mission which has recently, however, been forced to retire from the field, owing to financial difficulties. The people of the area have secured from the RCAF buildings which they have had towed to Alert Bay. These are to be converted into a seventy bed hospital with all modern conveniences, laboratories, x ray, isolation facilities, and so on. A maternity ward, and children's ward, built on the cubicle system, will be part of the hospital, which will be the largest hospital between Vancouver and Ocean Falls.

The death of Dr. G. A. B Hall of Nanaimo, at the age of eighty, marks the passing of a medical pioneer. Dr. Hall was a man of wide interests—was mayor of Nanaimo for many years, M.L.A. for Nelson, and contributed much to the life of his adopted Province. He leaves three sons, all doctors of medicine.

Dr C. T. Hilton, who has been practising in Port Alberni almost since it was in existence, has been honoured by that city by having a street named "Hilton Street" as a tribute to him.

The Northwest Regional meeting of the American College of Physicians was held in Vancouver, November 12 and 13, with a large attendance from Western Canada and the Western States of the United States.

J H MACDERMOT

## Manitoba

Dr F I Cadham has been appointed Chairman of the Provincial Board of Health, succeeding the late Dr E W. Montgomery.

On November 10, meetings were held in the town hall, Vita, and in Young United Church, Winnipeg, to celebrate the 25th anniversary of Vita Memorial Hospital which is owned and operated by the United Church of Canada. At Vita Dr. Waldon demonstrated the new Bombardier ambulance recently purchased for the use of the hospital during winter when ordinary cars cannot get through the snow. The Lieutenant Governor R F. McWilliams, Dr. C R Donovan acting Deputy Minister of Health, Judge F. A. E Hamilton, Chairman of the Board, and three local residents spoke briefly at the afternoon meeting and at the evening meeting Hon. Ivan Schultz, Minister of Health, Dr. W. W. Read the first Medical Superintendent and Dr. H V. Waldon the present Superintendent were the principal speakers.



Good progress is being made on the \$1,400,000 Maternity Pavilion of the Winnipeg General Hospital, fronting on Notre Dame Ave.

### New Brunswick

Dr. D. A. Thompson of Bathurst and Dr. John A. Finlay of Saint John are at present doing postgraduate work in cancer at the Memorial Hospital, New York.

Dr. H. A. Farris, of Saint John, attended the annual meeting of the American Climatological Association.

Dr. W. O. McDonald of Saint John, has been appointed chairman of a special committee of the New Brunswick Medical Society to find and bring under treatment unsuspected cases of diabetes in the Province. The work of this committee is to be carried on as originated by the American Diabetes Association. The other committee members are Drs. R. E. Washburn, H. S. Everett, H. A. MacKinnon, R. D. Roach, J. H. Smyth and D. A. MacLennan.

Dr. P. C. Laporte of Edmundston has begun a refresher postgraduate course at the Memorial Hospital, New York.

Dr. R. A. H. MacKeen, Director of Provincial Laboratories, has returned to duty after attending the meeting of the United States Public Health Association at Boston.

At the annual meeting of the Medical Council of New Brunswick held in Saint John on November 16, Dr. H. S. Wright was elected President for 1949. Dr. J. M. Barry of Saint John, was re-elected Registrar-Treasurer and Dr. A. S. Kirkland and Dr. L. D. Densmore were elected to the Medical Council of Canada.

Dr. Carl Trask, Medical Health Officer, for Saint John, was the special speaker at the November meeting of the Saint John Medical Society. His subject "Preventive Medicine in General Practice" was much enjoyed and practically everyone present took a spirited part in the discussion, making the evening one to remember.

Three New Brunswick physicians were honoured at the annual convocation of the Royal College of Physicians and Surgeons at Ottawa. Senator C. J. Venoit of Bathurst received a Fellowship in Surgery and Dr. A. B. Walter of West Saint John and Dr. A. Stanley Kirkland of Saint John, received Fellowships in Medicine.

A. S. KIRKLAND

### Nova Scotia

Dr. Hugh O'Reilly, a graduate of the University of Dublin has established himself in Freeport, Digby County.

Dr. R. R. Hogg, has joined the staff of the Dartmouth Medical Centre.

Dr. Clark who has practised since his graduation from Dalhousie at Moser River has moved to River John, Pictou County to take over the practice of the late Dr. J. Stewart Murray.

Dr. H. K. MacDonald of Halifax met with a serious accident when struck by a motor vehicle while crossing a street. For several days his condition was critical but the latest reports indicate that while he is out of danger he will be incapacitated for some time to come.

Dr. F. R. Little of Halifax is reported to be seriously ill.

Dr. W. H. Eagar, Dean of Nova Scotia radiologists is a patient in the Victoria General Hospital, Halifax.

Maritime Medical Care Incorporated sponsored by the Medical Society of Nova Scotia is in the process of organization.

Dalhousie University has recently inaugurated an affiliated course in nursing leading to the degree of Bachelor of Nursing Science. The course involves three full years of the regular science course and in addition the required period of hospital training necessary for the student to sit for the Registered Nurses' Examinations. Nurses who have already graduated may, if qualified, register at the University and secure the degree in three years. It is hoped that the course of one year in Public Health and Nursing Education open to graduate nurses will get under way in 1949.

Dr. L. N. Miller, Director of Medical Services for Newfoundland was recently in Halifax to secure information regarding public health organization and arrangements in Nova Scotia.

The mobile x-ray unit put in operation in Nova Scotia during the past summer for chest examinations has given excellent satisfaction. It is planned to continue the service all year round.

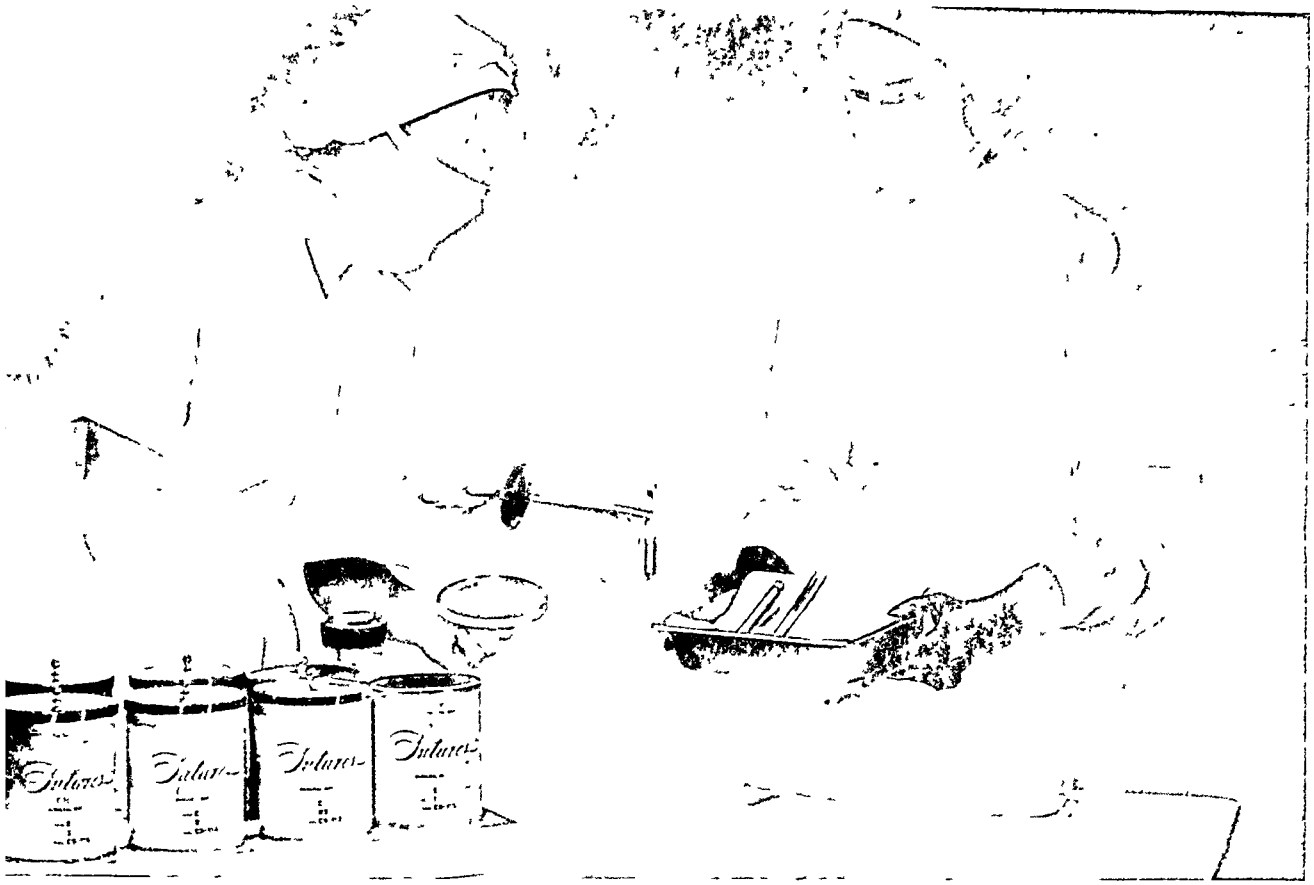
H. L. SCAMMELL

### Ontario

New appointments and promotions in the clinical departments of the University of Toronto, Faculty of Medicine have been announced. Re-establishment of the title of associate professor and the promotion of several assistant professors to that rank made it possible to promote younger men, many with war service, to faculty rank. A number of these appointees have been serving as demonstrators, a word being abolished in the clinical departments. The ranks formerly known as junior and senior demonstrators will be known as clinical teachers.

The appointments are as follows: associate professors of medicine: R. G. Armour, E. F. Brooks, W. R. Campbell, H. K. Detweiler, John Hepburn, R. B. Kerr, Trevor Owen, E. J. Trow; associate professors of paediatrics: F. F. Tisdall, E. A. Morgan; associate professor of radiology, A. C. Singleton; associates in radiology: E. H. Shannon, W. C. Kruger, D. T. Burke, C. L. Ash, J. D. Munn, Vera Peters; associate professors of surgery: R. I. Harris, R. C. Laird, A. B. LeMessurier, F. J. Lewis, J. C. McLelland, K. E. McKenzie, D. W. E. Murray, W. Keith Welsh, H. W. Wookey; associates in obstetrics and gynaecology: G. L. Watt, John Mann; associates in ophthalmology: R. G. C. Kelly, J. C. McCulloch; associates in otolaryngology: D. B. French, J. E. Strachan, A. H. Veitch; associates in medicine: W. Hurst Brown, T. A. Crowther, R. C. Dickson, J. W. Graham, A. B. Hagerman, R. I. MacDonald, V. F. Stock, J. A. Walters, N. H. Wrong, Gordon Bates; associates in surgery: H. E. Armstrong, J. H. Couch, A. W. Farmer, W. S. Keith, F. E. Kergin, D. R. Mitchell, R. M. Wansborough, A. W. M. White; assistant professors of otolaryngology: H. W. D. McCart, D. E. S. Wishart, J. A. Sullivan; assistant professors of medicine: H. A. Dixon, A. A. Fletcher, H. H. Hyland, G. W. Loughheed, E. J. Maltby, R. E. Rykert; assistant professors of paediatrics: T. E. H. Drake, Gladys Boyd, C. E. Snelling; assistant professors of surgery: J. L. McDonald, E. H. Botterell, S. D. Gordon, C. W. Harris, J. W. Ross.

The following graduates of the Faculty of Medicine were elected by ballot to be members of the University Senate: L. W. Black, M. H. V. Cameron, W. J. Deadman, J. L. King, H. I. Kinsey, S. J. N. Magwood, R. T. Noble, G. S. Young.



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A refresher course in Ophthalmology and Oto-Laryngology will be held under the auspices of the Faculty of Medicine, University of Toronto from January 24 to 29. The guest speakers will be Dr. Ramon Castroviejo of New York whose subject will be "Cataract Surgery" and Dr. Lawrence R. Boies of Minneapolis who will speak on "General Problems of Interest to the Practice of Oto-Laryngology".

The Toronto Board of Health lopped \$58,146 from Health Department estimates of \$1,871,000 for next year. Dr. Gordon Jackson, M.O.H., said the ordinary estimates did not include any expenditures which could be reduced without interfering with salaries or equipment.

The section of Industrial Medicine of the Toronto Academy with industrial nurses as guests, held a supper meeting at Lever Brothers Limited. The charmingly furnished anteroom and the bright cafeteria where the food had more flavour than that of most restaurants dispelled the old-fashioned notion of a factory as a dreary place. Dr. Norman Wrong spoke on "Recognition and Management of Common Skin Disorders in Industrial Practice"; Dr. W. Line on "Practical Psychological Approach in Industry", and Miss Blanche Bishop, Reg.N., on "Observations made at the Ninth International Industrial Medical Congress".

The thirty-sixth session of the Indian Science Congress will be held at Allahabad, India, January 2 to 8, among the eminent scientists expected to attend are Sir Robert Robinson, president of the Royal Society, Sir Henry Tizard and Professor S. Chapman from Britain; Professor Szentgyorgi from Hungary; Madame Curie-Joliot from France; Professor Englehardt from Russia and Professor C. H. Best from Canada.

Dr. Robert T. Noble of Toronto was elected president of the Medical Council of Canada at the annual meeting in Ottawa.

Dr. Carman J. Kirk, native of Perth County, has been appointed superintendent of Victoria Public Hospital, London. He has recently completed a postgraduate course in hospital management at Columbia University. Before joining the R.C.A.M.C. he practised in Saskatoon.

LILLIAN A. CHASE

Dr. Crawford Rose has again been acclaimed Mayor of Aurora, Ont.

Dr. John J. Day, a graduate of McGill University has been appointed Medical Officer of Health for Ottawa.

Dr. Alfred J. Rubenstein, a graduate of University of Toronto has begun practice in Windsor, Ont.

Dr. James Harkin, a graduate of Queen's University has been appointed Coroner for Renfrew and Nipissing.

Dr. George W. Slocombe has moved from the West and is now practising in Port Dover, Ont.

Dr. W. W. Silson has taken over a practice at Brighton, Ont.

The first sod for the building on Church Street, Weston for the fifty bed Humber Memorial Hospital was turned by the Hon. Ray Lawson on November 12, 1948.

On November 6, 1948, Drs. A. C. Norwich, W. W. Wright, R. A. Jamieson, N. S. Shenstone, E. J. Trow,

R. W. Carveth, J. C. McLelland, R. A. Thomas, Chas. McMane, E. F. Risdon, W. B. Seaton, N. T. MacLaurin, and Emerson McNeill were honoured for their long service with the Department of Veterans' Affairs by a dinner at the Albany Club, Toronto. NOBLE SHARPE

John Coleman Laidlaw, M.A., M.D., of Toronto has been awarded a Research Fellowship by the American College of Physicians for the year beginning July, 1949. These fellowships which are awarded in varying numbers each year are designed especially to aid young physicians in the early stages of preparation for a teaching and investigative career in internal medicine.

Now an assistant lecturer in biochemistry in the University College, London, England, Dr. Laidlaw proposes to continue studies there under Professor F. G. Young on the metabolism of certain cholinesterase inhibitors in regard to myasthenia gravis. Dr. Laidlaw has been designated by the Board of Regents as the Alfred Stengel Research Fellow for 1949-50.

Dr. J. Burke Ewing, of Wigan, Lancs., has been appointed Professor of Clinical Surgery in the University of Ottawa. Dr. Ewing is a graduate of Queen's University and in addition to extensive surgical experience has held administrative and teaching positions in Great Britain. He is married and has 4 children.

## Quebec

Dr. Ronald L. Denton, hæmatologist to the Children's Memorial Hospital in Montreal and well known for his work on erythroblastosis, has been chosen as Director of Laboratories for the Canadian Red Cross Transfusion Service.

Le professeur Raoul Kourilski, de la Faculté de Paris, invité par l'Institut scientifique franco-canadien, a donné des leçons cliniques à plusieurs hôpitaux universitaires de Québec et de Montréal.

A four year course in psychiatry for graduates in medicine is being organized at McGill University.

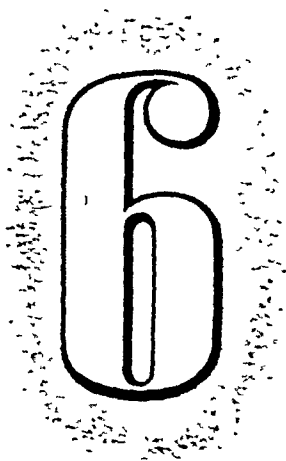
L'ophtalmologiste montréalais Jean-Audet Lapointe, chargé de cours à l'Université de Montréal, a représenté celle-ci au Congrès international d'ophtalmologie, tenu à Paris. Il a donné des démonstrations de greffe de la cornée, opération dont la technique lui doit beaucoup.

L'Université d'Ottawa a décerné le doctorat en droit à MM. Donatien Marion, directeur général de l'Association des Médecins de langue française du Canada, et Charles Vézina, doyen de la Faculté de médecine de Laval.

Deux cent six étudiants en médecine reçoivent cette année des octrois du Gouvernement de la Province de Québec. Les jeunes médecins que ces octrois auront aidé à terminer leurs études s'engagent en retour à s'établir dans les régions où le manque de médecins est le plus aigu. PAUL DE BELLEFEUILLE

At a recent meeting of the American Society of Maxillofacial Surgeons held in Ann Arbor, Michigan, Dr. John W. Gerrie read a paper entitled "Fractures of the Maxillary Zygomatic Compound", and Dr. Hamilton Baxter delivered a paper (for Dr. M. A. Entin) on "Progressive Lipodystrophy: Report of Three Cases". Dr. Gerrie has just completed his service as a member of the Board of Trustees of this Society.

The Board of Trustees have chosen Montreal as the site of the annual meeting to be held in September, 1949.



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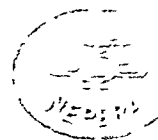
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1. Carroll, G., and Allen, N. H. J. Urol 55: 674 (1946).

2. Kirwin, T. J., and Bridges, J. P.: Am. J. Surg 52: 477 (1941).

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## Saskatchewan

Dr. Anna Nicholson of Saskatoon attended the 23rd annual meeting of the Congress of Anaesthetists at the joint session of the International Anesthesia Research Society held in Montreal from October 18 to 22. As President of the Federation of Medical Women of Canada and Chairman of the Saskatchewan division of the Canadian Anaesthetists Society, she represented both groups. On her return she was entertained in Winnipeg, and with the Executive of the Federation made plans for the year's activities, including the Canadian Medical Association Convention in Saskatoon next June. Recently she was asked to do a broadcast on the CBC International Service shortwave to England on the history of the Federation of Medical Women and the present status of the woman physician in Canada.

Dr. B. C. Leech of Regina, President of the Canadian Anaesthetists Society attended the 1948 Annual Meeting of the American Society of Anesthesiologists in St. Louis in November, as a friendly observer and official representative of the Canadian Anaesthetists' Society.

Dr. M. G. Israel, Regina, received his F.R.C.P.[C.] at the meeting of the Royal College in Ottawa, November 28, 1948.

Dr. C. F. W. Hames, Deputy Minister of Public Health, and Mrs. Hames have returned to Regina after a trip to the east. While there, Dr. Hames attended the semi-annual meeting of the Dominion Council of Health at Ottawa and the annual American Health Association at Boston.

The sudden cessation of building on the University hospital in September created a great discussion across the Province. The completion of the hospital has been reconsidered and work has now restarted on Wing G, which is the wing adjacent to the medical school. The construction on this wing had proceeded to the stage where structural steel could be erected. No decision has yet been made for the remainder of the hospital but it is expected that work will proceed as finances and materials are available. It is possible that the remainder of the hospital may not be finished in the immediate future on the same scale as planned when building stopped in September. The work already done on the foundations will be protected and preserved.

The annual election for Council for the College of Physicians and Surgeons has been completed. Elections were held in four Electoral Districts and the following members will represent these districts for the next two years. Dr. C. J. Houston, Yorkton; Dr. J. J. Hamelin, North Battleford; Dr. H. Gordon Young, Moose Jaw; and Dr. J. E. McGillivray, Weyburn.

A change in policy of supplying benefits to the recipients of the Old Age Pension, Mother's Allowance, etc., medical services has been announced relating to drugs. The cost of supplying drugs has advanced steadily until it almost approximates the cost of a general practitioner service. Previous to this change in policy all drugs were a benefit and paid for completely. From December 1, 1948 the plan will not supply patent medicines or common household remedies at all. Certain of the more elaborate specialties will not be supplied and they will be named. For the remaining drugs the recipient will be required to meet one fifth of the cost. It is felt in this way that the recipient will have a direct interest in the cost of materials obtained under the plan. In circumstances that might produce hardship or where it would appear that the initial cost must be borne by the government, machinery is established to allow this. In other words the patient is still protected against cost.

Such essential preparations as insulin and liver extract for pernicious anemia are still supplied absolutely free and the regulation does not apply to them.

It has been announced that a special convocation of the University of Saskatchewan will be held in June, 1949, in conjunction with the meeting of the Canadian Medical Association.

Dr. John C. Dundee of the Saskatoon Sanatorium staff left recently for Philadelphia, where he will take a post-graduate course in bronchoscopy.

Dr. B. A. Jackson, F.R.C.S.(Edin.), was admitted to Fellowship in the Royal College of Physicians and Surgeons of Canada, at Ottawa, November 28, 1948.

G. G. FERGUSON

## General

The Royal College of Physicians and Surgeons of Canada announce the following admissions to Fellowship by examination, November, 1948.

### MEDICINE

Robert Leander Aikens, Montreal, Que.; William McCaskill Cameron, London, Ont.; Andrew Lawrence Chute, Toronto, Ont.; Robert Roy Phillips Forsey, Montreal, Que.; Robert Genest, Montreal, Que.; James Hutcheson Graham, Ottawa, Ont.; James Harvey Bruce Hilton, Ottawa, Ont.; Max Israel, Regina, Sask.; Walter Leslie, Halifax, N.S.; Benjamin Harry Lyons, Winnipeg, Man.; George William Manning, London, Ont.; David John MacKenzie, Agincourt, Ont.; Arthur Frank Nancekivell, Toronto, Ont.; John Campbell Rathbun, London, Ont.; William Donald Ross, Montreal, Que.; Philip Archibald Ryan, Toronto, Ont.; Raymond Clare Smith, Toronto, Ont.; Lorne Shapiro, Montreal, Que.; Henry Augustus Sims, Ottawa, Ont.; James MacKenzie Sinclair, Edmonton, Alta.; Harry Clyde Slade, Toronto, Ont.; Robert MacKay Taylor, Toronto, Ont.; James Alan Traynor, Toronto, Ont.; James Gairdner Watt, Toronto, Ont.; Benjamin Morrill Wheeler, Edmonton, Alta.; George Suter Williamson, Ottawa, Ont.

### SURGERY

John Duncan Franklin Alexander, Montreal, Que.; Charles Alexander Allard, Mount Royal, Que.; Norman Charles Delarue, Toronto, Ont.; Frank P. Flood, Montreal, Que.; Georges Philippe Fortier, Edmonton, Alta.; Leonard Benjamin Frutkin, Vancouver, B.C.; Louis-Alexandre Frenette, Quebec, Que.; William Jacob Friesen, Winnipeg, Man.; Roger Gariépy, Montreal, Que.; William Edward Gibson, Wilkesburg, Pa.; Joffre André Gravel, Quebec, Que.; Fraser Newman Gurd, Montreal, Que.; Donald Nelson Henderson, Toronto, Ont.; Francis Charles Hoare, Westmount, Que.; James Francis Hopkirk, Boston, Mass.; Fred Lottridge Johnson, Hamilton, Ont.; Charles Douglas Keeley, London, Ont.; Jean Paul André Latour, Montreal, Que.; Louis R. Letienne, Three Rivers, Que.; Geraldine Catherine Maloney, Toronto, Ont.; Joseph Claude Arthur Marchand, Montreal, Que.; Permeshwari Dayal Mathur, Jaipur, India; Norman Paul Merkeley, Winnipeg, Man.; John Tenbroeke MacLean, Montreal, Que.; Ian Bruce MacDonald, Toronto, Ont.; Seymour Gordon MacKenzie, Truro, N.S.; Walter Campbell MacKenzie, Edmonton, Alta.; Douglas Bigelow MacLaren, Toronto, Ont.; John Murray McIntyre, Montreal, Que.; Edgar Paul Nonamaker, Halifax, N.S.; John Dickinson Palmer, Montreal, Que.; Thomas Primrose, Montreal, Que.; Malcolm James MacLeod Putnam, Westmount, Que.; George Horwood Raymond, Montreal, Que.; Olav Røstrup, Edmonton, Alta.; Louis-Philippe Roy, Quebec, Que.; John Leslie Russell, Toronto, Ont.; Otto Arnold Schmidt, Winnipeg, Man.; Edison Lloyd Russell



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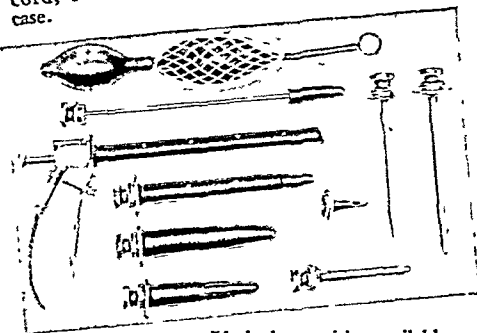
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The following have been received into Fellowship in the **American College of Surgeons** at the Convocation in Los Angeles on October 22, 1948.

**Alberta.**—Albert W. Hardy, Edmonton; William E. Ingram, Calgary; John M. Lees, Edmonton; Stephen S. Parlee, Edmonton; Donald W. Ramsay, Calgary; Olav Rostrup, Edmonton.

**British Columbia.**—Frank P. Patterson, Vancouver; Frederick E. Saunders, Vancouver.

**Manitoba.**—Albert C. Abbott, Malcolm R. MacCharles, Frederick G. McGuinness, Samuel S. Peikoff, all of Winnipeg.

**New Brunswick.**—Kenneth W. MacKenzie, Moncton; J. H. Melville Rice, Campbellton; Donald A. Thompson, Bathurst.

**Nova Scotia.**—G. Watson Sodero, Sydney.

**Ontario.**—Eben Alexander, Toronto; William E. Collins, Ottawa; Francis R. Harvey, Kitchener; H. Allister Lackner, Kitchener; E. L. Russell Schram, London.

**Quebec.**—Gerald T. Altimas, Montreal; Roland Cauchon, Quebec City; Clayton H. Crosby, Montreal; François X. Demers, Quebec City; Stuart D. McKinnon, Noranda; Antonio Samson, Montreal; Douglas W. Spirling, Montreal; E. Walter Workman, Montreal.

**Saskatchewan.**—Elmer H. McFadyen, Saskatoon.

The second Commonwealth and Empire Health and Tuberculosis Conference will be held in London, England, July 5 to 8, 1949. The last conference, held in 1947, had an attendance of over 1,000, from 50 countries. This is open to all interested in preventive medicine, including doctors, nurses, social workers, health administrators, etc. The conference fee is 3 guineas for the four days, or one guinea for a day.

Further details from the Secretary, NAPT, Tavistock House North, Tavistock Sq., London, W.C.1, England.

The American College of Surgeons announces that six 2-day sectional meetings will be held between January 7 and April 13, 1949, for physicians and surgeons, and professional personnel of hospitals. A seventh meeting to be held in the West the latter part of April will be announced later. The latest developments in medical science and in hospital service will be presented at each meeting. The schedule follows: January 7, 8, Edgewater Park, Mississippi, Edgewater Gulf Hotel; January 14, 15, Houston, Texas, Rice Hotel; February 11, 12, Kansas City, Missouri, Hotel President; March 15, 16, Washington, D.C., Statler Hotel; March 21, 22, Buffalo, N.Y., Statler Hotel; April 12, 13, Edmonton, Alta., MacDonald Hotel.

Conferences for the hospital personnel and for the medical groups will run concurrently. A joint meeting of the two groups will open at 8.30 a.m. each day with the showing of medical motion pictures, followed by separate sessions at 10.00 a.m. Luncheons for the physicians and surgeons and for the hospital representatives respectively, will be held daily. Separate afternoon sessions beginning at 2.00 o'clock will be held for the two groups. There will be a dinner meeting followed by a round table conference on the first of the two days.

## BOOK REVIEWS

**Hormones and Behaviour.** F. A. Beach, Professor of Psychology, Yale University. 368 pp. \$6.50. Paul B. Hoeber, Inc., New York, 1948.

The foreword to this book was written by Dr. Earl T. Engle who said, in part, "This volume is a most comprehensive statement of the measurable factors of animal behaviour especially as related to sex. It will be a book of constant reference for physiologists and psychiatrists, for zoologists and sociologists, and for all those who are interested in deriving from animal experiments the basic principles to be used in some future comprehensive analysis of human behaviour." The book includes a bibliography of 64 pp. This extensive literature is surveyed critically by the author. Most of his own personal researches were done while chairman of the Department of Animal Behaviour at the American Museum of Natural History in New York. The book deserves commendation as a very valuable and well-written reference work.

**Influences of Gonadotropic and Sex Hormones on the Gonads of Rats.** J. H. Gaarenstroom and S. E. De Jongh, Pharmacological Laboratory of the National University of Leyden. 180 pp., illust. \$3.00. Elsevier Publishing Co., Inc., New York and Amsterdam, 1946.

This book is mainly a report of work performed in the authors' laboratory during the isolated period of the war years. Considerable experimentation on rats is presented under two large sections, the testes and the ovary. The readers may have a little difficulty in obtaining a clear comprehension of this report, partly due to the English composition and partly due to the new nomenclature with the resultant frequent use of unfamiliar abbreviations. The theories and hypotheses have the quality of originality. The book merits detailed study by research workers in this field.

**Intracranial Complications of Ear, Nose and Throat Infections.** H. Brunner, Associate Professor of Otolaryngology, University of Illinois College of Medicine, Chicago. 444 pp., illust. \$6.75. The Year Book Publishers, Inc., Chicago, 1946.

This is a very readable book, well printed and illustrated. It is divided into two sections: Section 1. General Introduction, scarcely does justice to Section 2. Clinical Aspects. Section 1 presents considerable material which is somewhat outside the sphere of the clinical otolaryngologist. Some of this material may not be acceptable to all readers. For example, a normal cerebrospinal fluid cell count of 5 to 10; the technique of spinal puncture, and pneumoencephalography, or the rectal administration of magnesium sulphate for post-puncture headache. In Section 2, the author appears to be really at home. The clinical aspect is well presented. One feature that gives lively interest to the text is the liberal use of actual case histories. Anatomy, Physiology, and Pathology in relation to all subjects discussed are exceptionally well covered. The arrangements of material is excellent. The chapter on inflammatory diseases of the meninges is particularly good. Chemotherapy and supportive therapeutic measures for all conditions discussed are conveniently grouped in one division, thus avoiding tiresome repetitions. The book is recommended to advanced students and interns.

**Medicine and Science in Postage Stamps.** W. J. Bishop, Librarian, Wellcome Historical Medical Museum; and N. M. Matheson, Surgeon, Ashford County Hospital, Middlesex. 82 pp., illust. 7/6d. Harvey & Blythe Ltd., London, W.1.; H. K. Lewis & Co. Ltd., 1948.

This little volume will no doubt be of great interest to philatelists, particularly as it seems to be the first of its kind; for while there is much literature on medical

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philately, it is scattered widely. The casual medical reader also will find much in it to attract him. There are many famous medical names which have not yet appeared in the postage stamp gallery. Some countries, notably Great Britain are almost entirely without any issues commemorating medical names. France has many times brought out Pasteur, but Lister, Harvey, Hunter, still await this honour. Florence Nightingale appears, but on Belgian and Costa Rican stamps. Probably some countries are more stamp conscious than others; it is one of the many interesting points which must crop up in philately. The book is a very pleasant addition to the literature on one of the most attractive facts of medical history.

**Occupational Medicine and Industrial Hygiene.** R. T. Johnstone, Consultant in Industrial Health; Lecturer at the University of California, Los Angeles. 604 pp., illust. \$11.00. C. V. Mosby Co., St. Louis, Mo.; McInsh & Co. Ltd., Toronto, 1948.

In 1912 the author published a textbook "Occupational Diseases" which has rapidly become a most widely used reference on the subject. The popularity of this book resulted largely from its excellent clinical and diagnostic information, its brief but vivid descriptions of industrial processes and its excellent therapeutic suggestions. In his new book "Occupational Medicine and Industrial Hygiene" the author has maintained the excellent clinical reference material revised and brought up to date in respect to the newer industrial processes and exposures and in respect to diagnosis and treatment. In addition to this, excellent chapters have been prepared dealing with industrial health administration, workmen's compensation and to the training of physicians to meet industrial needs. The author has very effectively reinforced his description of dangerous trades with over 100 excellent photographic illustrations and has devoted a good deal of space to a most practical discussion of both medical and engineering methods of control of occupational disease. Physicians who practise in industrial communities require a knowledge of industrial medicine and industrial hygiene and a reference book on the subject of occupational disease. This book provides a comprehensive review of the subject and is highly recommended as a reference for industrial physicians, practitioners and medical students.

**Oculorotary Muscles.** R. G. Scobee, Instructor in Ophthalmology, Washington University School of Medicine, St. Louis, Mo. 359 pp., illust. \$9.00. The C. V. Mosby Co., St. Louis; McInsh & Co., Ltd., Toronto, 1947.

There has long been a need for a readable, concise, and readily understandable book dealing with the function of binocular vision, as the average student usually finds this a most difficult study. Most treatises are either too encyclopaedic or too specialized for his purpose. The author of this volume has written for this audience, and has largely succeeded in his effort.

On the other hand, the more expert will find some disappointing aspects. All too little space is given to therapy. The applications of orthoptics and surgical techniques are rather raced over. One should never think of the oculorotary muscle problem without keeping in mind at all times the sensory aspects of the situation. The basic situation is one of nervous reflexes. Thus, afferent functions have a most important action on the motor and effector mechanisms. In this book this aspect is inadequately handled. The orthoptic approach, admittedly still an imperfect one, is our only approach to this aspect. The author has given all too little space to this means of investigation and treatment. On occasion he appears almost contemptuous of it, and thus he is led astray, as when he places simple convergence exercises before orthoptic exercises in the treatment of exophoria. Thus, he says (erroneously) that "a patient who gains no relief from the convergence exercises properly done will usually gain no benefit from orthoptics". Simple

convergence exercises do not adequately handle the suppression which is usually present in these cases. Indeed, the whole question of suppression and its treatment is not given sufficient prominence in the entire book.

**Oral Vaccines and Immunization by Other Unusual Routes.** D. Thomson, Director of the Pickett-Thomson Research Laboratory; R. Thomson, Pathologist, St. Paul's Hospital, London; assisted by J. T. Morrison, M.D., D.P.H. (Aberdeen). 329 pp. \$10.50. Published for the Pickett-Thomson Research Laboratory, London, N.W.7 by E. & S. Livingstone Ltd., Edinburgh, 1948.

This volume gives a summary of a great deal of the work which has been done and the opinions expressed on the use of oral vaccines. It is divided into four parts, which deal with general information on oral immunization, oral method of immunization against various diseases, oral prophylaxis with toxins and toxin-antitoxin mixtures and lastly on immunization by other unusual routes such as intratracheal installation and intranasal vaccines. Considerable attention is given to the review of the use of B.C.G. vaccine and the reader would find this part a good summary of the continental experience with the vaccine. Each part gives a digest of the work done and published, followed by the authors' conclusions. As outlined in the preface, "a book of this kind is not meant to be read like a novel". "As a work of reference, however, the research worker will find it of considerable assistance and value." The reviewer agrees with both of these statements, particularly the latter. It represents well over 1,000 research papers and a ready reference for much of the material on this subject. For these workers interested in the subject of oral vaccines this forms a most useful reference volume.

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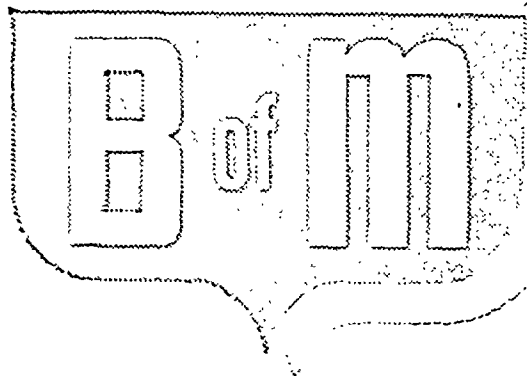
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From the *Journal* of January, 1919

**NEWS: Army Medical Services.** The Distinguished Service Order has been awarded to Major A. L. Lockwood, M.D., for gallantry under fire with the Royal Army Medical Corps. In 1916, Major Lockwood was decorated with the Military Cross for gallantry while acting at an advanced dressing station, and still later won the Mons Star for participating in the early fighting in 1914. His home is in Westport, Ontario, and he is a graduate of McGill University of the class of 1910.

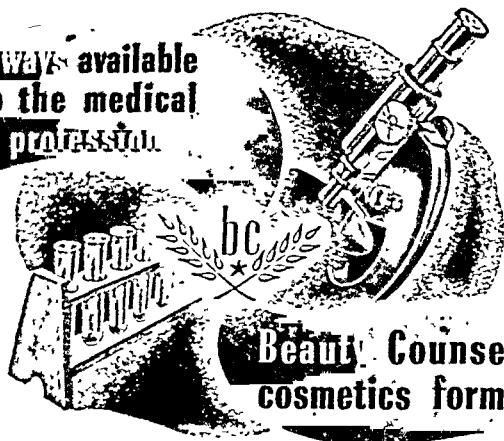
The King paid a special visit to the Canadian Hospital at Doullens during his recent visit to France. It had been deliberately bombed by the Germans a few months before. The King listened to the story of the outrage, which was related by the commanding officer, and as he was leaving he paid a special tribute to the nursing sisters and doctors, saying "By continuing your work of mercy after such a terrible experience you have set an example to the whole world."

Dr. A. G. Nicholls, Professor of Pathology and Bacteriology in Dalhousie University, who has been for the past three years Fortress Sanitary Officer at Halifax, with charge of the District Laboratory of Hygiene, has been appointed D.A.D.M.S. (Sanitation) M.D. No. 6, with rank of major.

**British Columbia.** The Vancouver Medical Society are planning a state medical service; the president, Dr. J. W. Ford, explains the situation. Medical supervision in the school and the Workmen's Compensation Board have already established a partial state service. In England the idea has been more fully developed in the system by which everyone has an option of joining the state medical service by paying so much from his wages, receiving in return free medical treatment. While any such measures would have to be enacted by the provincial legislature, it would be necessary first to have the main body of medical men in co-operation.

**SPECIAL NOTE:** "Bip" is one of the few words that will be added to the dictionary as the direct outcome of the war. "Bip" is a combination of bismuth, iodoform, and paraffin paste, and is the name given to one of the most important discoveries of Dr. Rutherford Morrison, the famous operative surgeon. By the new process the destroyed tissues and infected areas are excised, the parts thoroughly drenched with pure spirit and after the application of a thin layer of "bip" the wound can, in many cases, be sewn up immediately, with every prospect of primary union and no further distress to the patient. Even wounds associated with bone injuries or damaged joints have been successfully treated by this method, and compound fractures have lost much of their seriousness. A London military hospital records a marvellous case of a piece of shell which penetrated a soldier's chest and diaphragm, passing into the abdominal cavity. These terrible injuries were inflicted without subsequent ill consequences, the trace of the missile being excised and the wound sutured after a thorough application of "bip". Similar success has been attained in cases of gas gangrene since the germs of this infection can no longer thrive.

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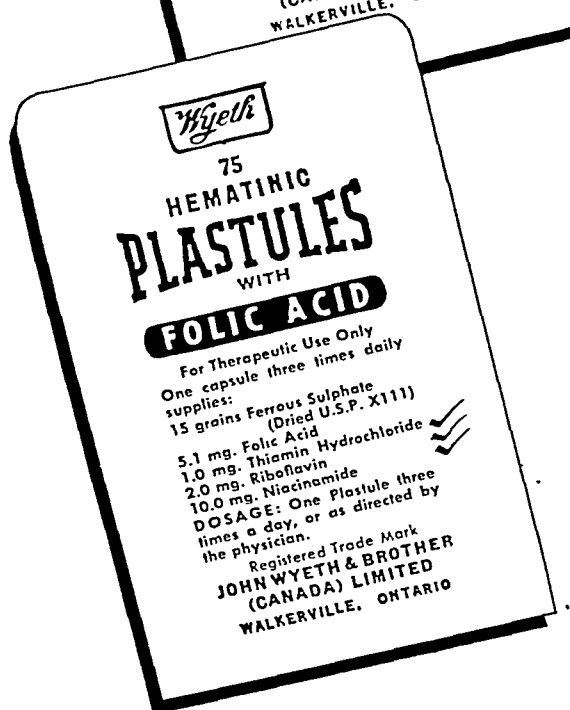
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The Surgical Staff of the Royal Victoria Hospital are conducting their fourth annual course in surgery designed especially for those wishing to write the F.R.C.S.(C.) in October. The course consists of two sections. The correspondence portion will commence May 1st and will consist of selected reading with weekly written questions. The clinical and didactic full time course will be held at the Hospital starting the second week in August and will last two months. All the required work will be presented by the various specialists and will consist of Physiology, Anatomy, Pathology, X-Ray in association with General and Special Surgery.

Fee for course, \$225.00.

Address applications or inquiries to:

THE POST-GRADUATE BOARD  
Royal Victoria Hospital  
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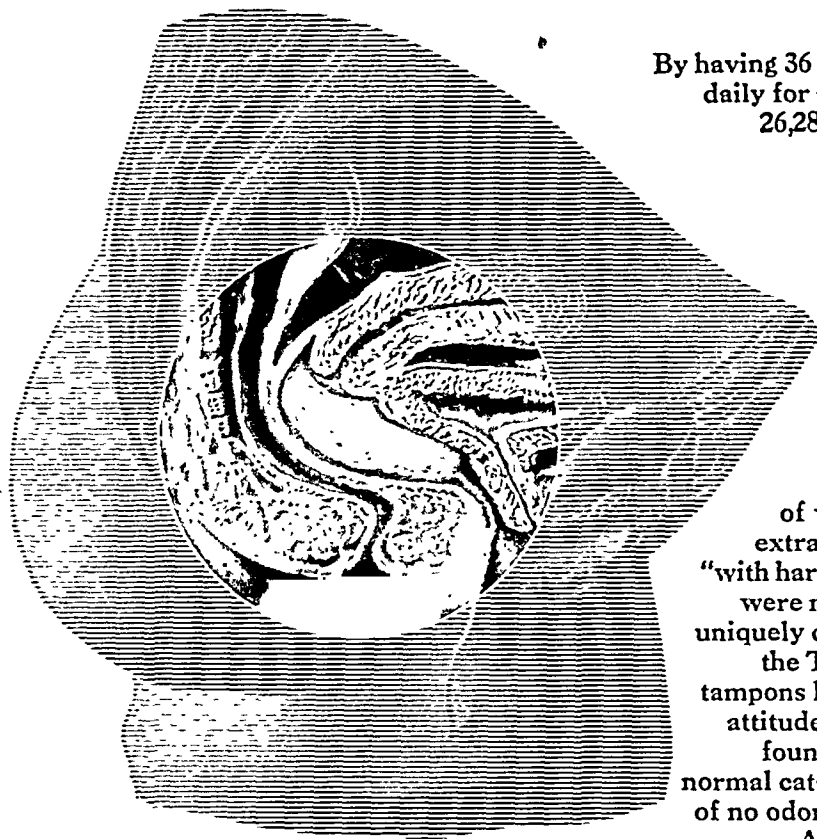
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By having 36 women insert TAMPAX twice daily for a solid year—using a total of 26,280 tampons, or the equivalent of a 200 years' supply for one woman—a leading gynecologist has proved *unequivocally* that TAMPAX *is safe!* Continuing bacteriologic studies, biopsies, pH and glycogen determinations and gross visual and pelvic examinations before, during and after TAMPAX usage revealed no evidences of vaginal irritation during this extraordinarily harsh test. In fact, "with hardly an exception, the findings were most favorable."<sup>1</sup> During this uniquely comprehensive investigation, the TAMPAX wearers reported the tampons helpful in their psychological attitude towards menstruation; and found them no impediment to the normal catamenial flow, and productive of no odor associated with the menses.

Authoritative studies by other clinicians<sup>2,3,4,5</sup> have confirmed these findings, and further corroborated the now indisputable fact that TAMPAX cannot cause irritation, erosion or vaginitis. These are but a few among the many cogent reasons why TAMPAX is more than ever, today, the internal menstrual guard of choice!

REFERENCES: 1. West. J. Surg. Obst. & Gynec., 51:150, 1943. 2. J.A.M.A., 128:490, 1945. 3. Am. J. Obst. & Gynec., 46:259, 1943. 4. Med. Rec., 155:316, 1942. 5. Clin. Med. & Surg., 46:327, 1939.

\*Approximate total number of days of menses in year.

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Three absorbencies:  
Super,  
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CANADIAN TAMPAX CORPORATION LIMITED,  
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— Please send samples and literature.  
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Accepted for Advertising by the Journal of the American  
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# 0 SAVE TIME for Busy Doctors . . .

A well-known Paediatrician has prepared three standard diets for Infant Feeding:

**Diet A, covering 4-7 months**

**Diet B, from 6-12 months**

**Diet C, from 10 months to 2 years**

The time for introducing new foods is left to your discretion, depending on the individual baby's tolerance. Space is provided for you to write in special instructions.

To get these Infant Diets, in handy pad form, printed with your name, address and phone number — write:

**Nutrition Service Bureau,  
Canadian Cannery Ltd.,  
Hamilton, Canada,**

—and we'll be glad to provide them at no cost or obligation to you.

The image shows three overlapping diet cards for Diet A, B, and C. Each card is for a different doctor, Dr. John R. Doe. The cards are titled 'DIET A', 'DIET B', and 'DIET C' respectively. Each card has a table with columns for 'Time' and 'Amount'. The table for Diet A is as follows:

Time	Amount
6.00 a.m.	Breast Feeding or Formula
9.00 a.m.	Stra and Tomato Juice (Aylmer Baby) or Orange Juice
10.00 a.m.	Cereal
2.00 p.m.	Breast Feeding or Formula
4.30 p.m.	Stra and Vegetable (Aylmer) or Strained Vegetable Soup (Aylmer) or Vegetable Liver and Beef Soup (Aylmer)
6.00 p.m.	Breast Feeding or Formula
10.00 p.m.	Cereal
10.00 p.m.	Breast Feeding or Formula
Formula	Milk
Tea or	ounces
	measures

Each card also has a 'DATE' field and a 'SPECIAL INSTRUCTIONS' field. The cards are shown overlapping, with Diet A on top, Diet B in the middle, and Diet C at the bottom.

Aylmer double-strains baby foods to a 27/1000ths of an inch, without breaking down the natural cell structure of the food. This ensures the infant getting easily-digestible food which helps prepare the system for the assimilation of regular foods at a later date.

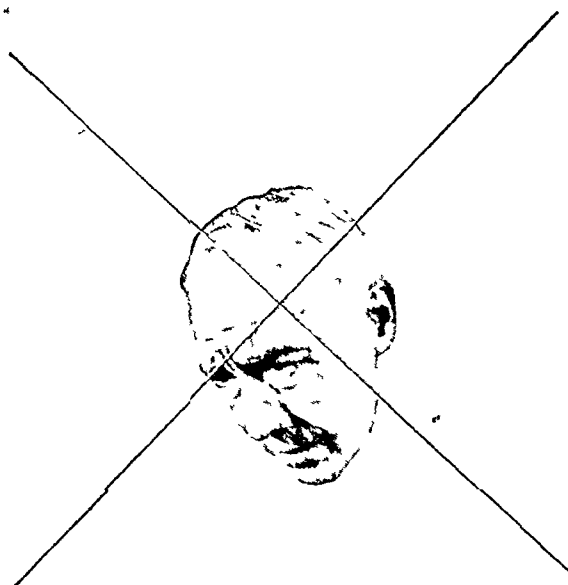
24 Aylmer Baby Foods—soups, meat, vegetables, fruits, desserts, all carefully double-strained—around which to build a feeding schedule.

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When the cause of the underlying  
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'Benzedrine' Sulfate has proved its  
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Attending *old age*

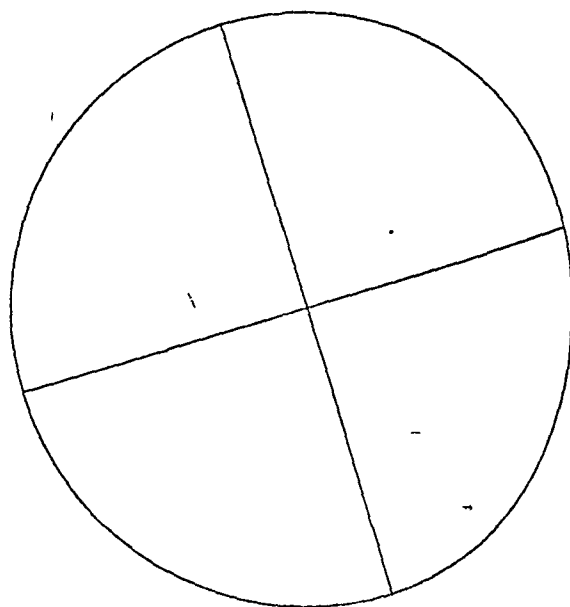
With prolonged *postoperative recovery*

Accompanying *prolonged pain*

When psychopathic problems develop *after childbirth*

Precipitated by *the menopause*

With debilitating or crippling *chronic organic disease*

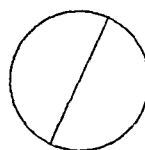


# Benzedrine Sulfate

tablets • elixir

(racemic amphetamine sulfate, S.K.F.)

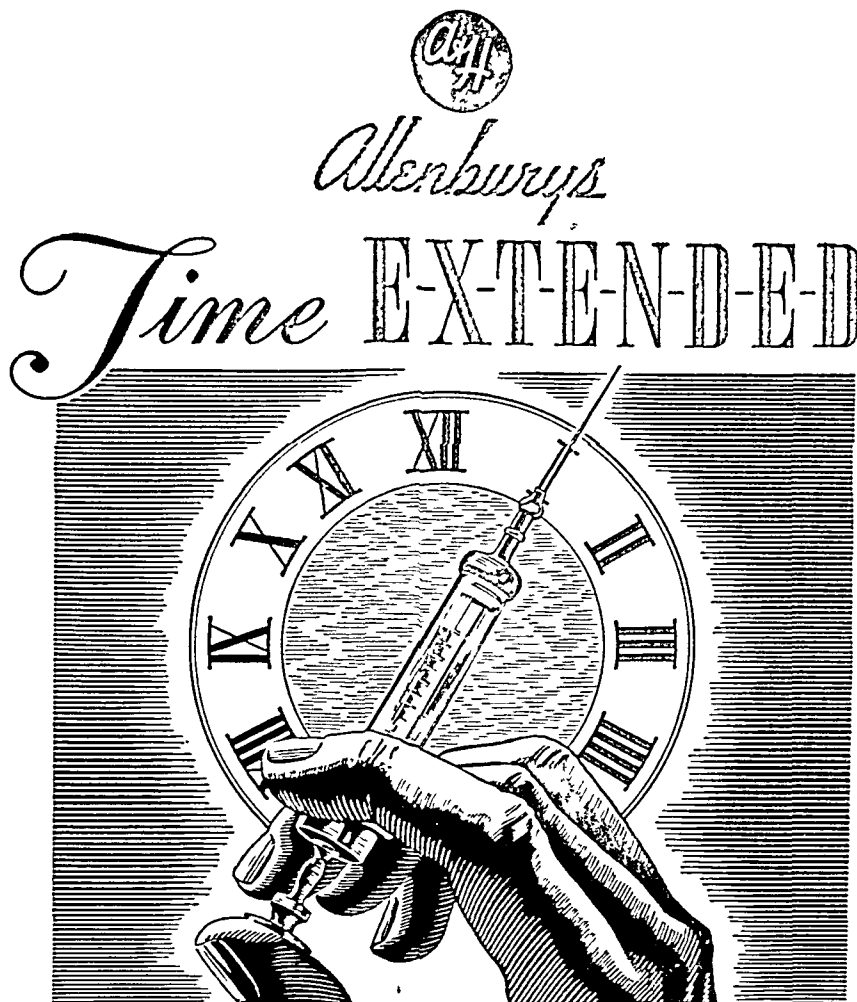
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A boon to Patient, Doctor and Nurse

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Morphine, gr.  $\frac{1}{4}$ , hyoscine, gr. 1 80, epinephrine, gr. 1 160, (as mucates) per c.c. Produces amnesia and narcosis for about 8 hours, without fall of blood-pressure.

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1 in 1000 (as mucate).  
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Morphine, gr.  $\frac{1}{2}$  (as mucate) per c.c. Relieves pain for 8 to 12 hours.

BOXES OF 12 AMPOULES OF 1.1 c.c.

Complete literature supplied on request.

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# McCarthy Electrotome

This newly developed modification of the McCarthy Electrotome was designed for use on infants or adolescents or in cases involving very small urethras.

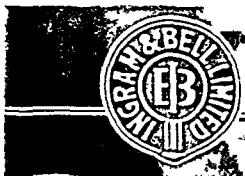
It employs a working element with standard McCarthy rack and pinion motion, reduced in size to fit the 16 Fr. Berry sheath, and a miniature McCarthy Foroblique telescope. A specially designed obturator accommodates the sheath, which contains a rotating water inlet.

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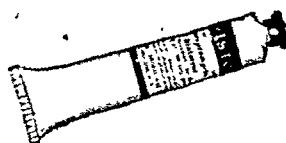


\*Trade Mark Regd

# Streptomycin *is now available in* Ointment *form*

Here is another original contribution to the antibiotic armamentarium from Bristol Laboratories: streptomycin sulfate for topical application, in a smooth, greaseless, ointment base. This significant development of Bristol research is noteworthy for the following:

## 1. *A Broad Antibacterial Spectrum*



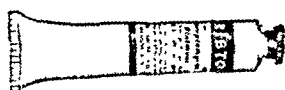
The variety of bacteria destroyed or inhibited by streptomycin is remarkably broad. Its antibacterial spectrum surpasses those of other antibiotics in current use for topical application.

## 2. *Non-Sensitizing*



Streptomycin in ointment form avoids the greatest single objection to topical antibiotic therapy in that it is practically non-sensitizing.

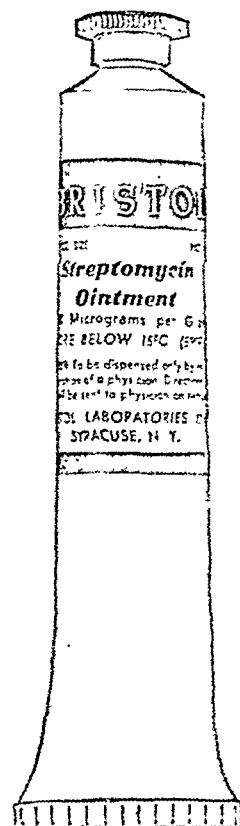
## 3. *A Water-Soluble Ointment Base*



Bristol Streptomycin Ointment is unusually pleasant to use, because it is incorporated in a smooth, water-soluble base. Despite the fact that there is no grease or oil, adequate potency can be expected to persist throughout the full dating period of nine months after manufacture.

Bristol STREPTOMYCIN OINTMENT is indicated in skin and wound infections due to streptomycin-sensitive organisms. Each gram of the ointment contains 5000 micrograms of pure streptomycin.

Available NOW from your usual source of supply,  
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or Hospital**



*Vinethene is an efficient inhalation anaesthetic, particularly suitable for operations of short duration, for induction prior to ether anaesthesia, and for complementing nitrous oxide-oxygen.*

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**VINETHENE**

*An Inhalation Anaesthetic for Short Operative Procedures*

Available in 25, 50, and 75 c.c. bottles and packages of 3-10 c.c. bottles with dropping caps.

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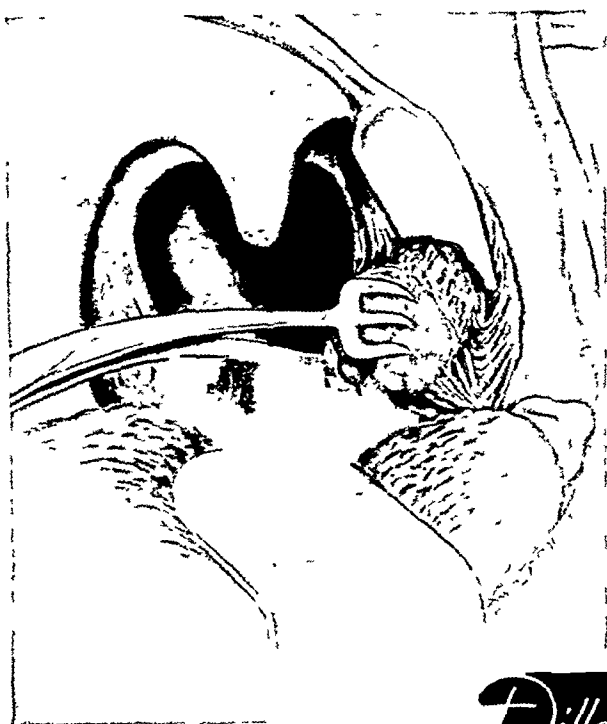
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POST-TONSILLECTOMY  
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through "Salivary Analgesia"



In post-tonsillectomy care—and for relief of "sore throat" in acute and chronic tonsillitis, pharyngitis—Aspergum provides salivary analgesia; the analgesic is continually and gradually released as the preparation is chewed.

Aspergum brings pain-relieving acetylsalicylic acid into intimate, prolonged contact with crypts and folds of the mucosa seldom reached, even intermittently, by gargling or irrigation.

Gentle stimulation of muscular action helps relieve local spasticity and stiffness.

Dillard's Aspergum contains  $3\frac{1}{2}$  grains of acetylsalicylic acid in a palatable chewing gum base—an easy and pleasant means of providing analgesia and antipyresis, particularly for children.

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Modern scientific practice concedes the necessity for bulk  
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by simple osmosis, increases the bowel's liquid content; the  
fecal residue is softened and gentle fluid bulk is the result.

The degree of activity of this balanced saline is  
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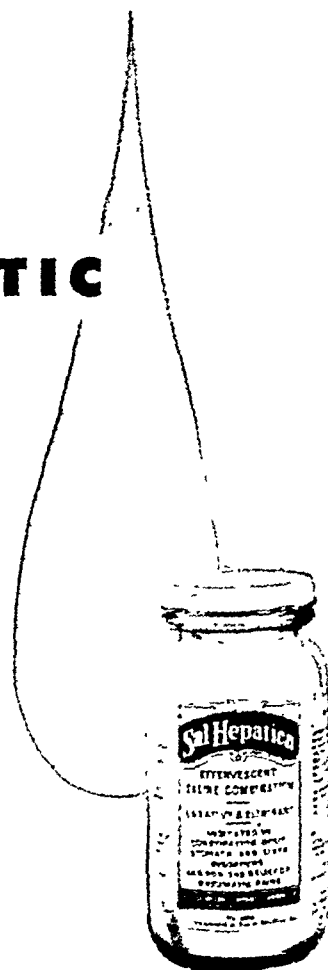
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For gentle yet speedy relief prescribe

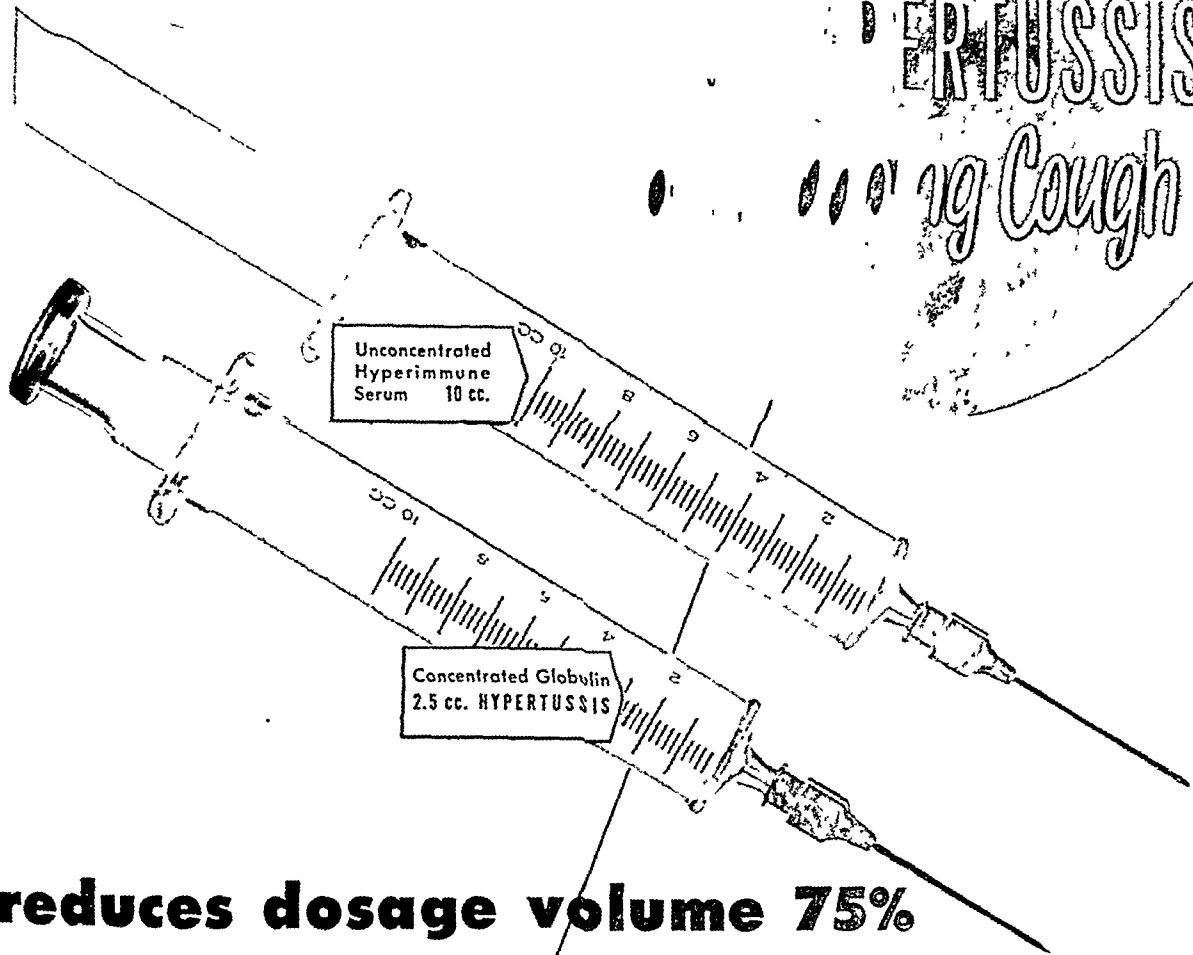
# SAL HEPATICA

Product of BRISTOL-MYERS COMPANY OF CANADA LIMITED  
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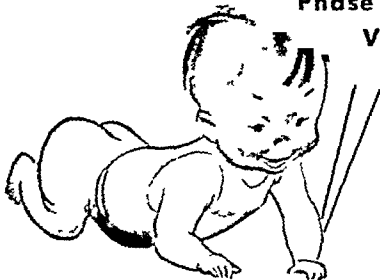
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**reduces dosage volume 75%**

**2.5cc HYPERTUSSIS**

highly concentrated and purified gamma globulin of pooled human serum from healthy donors hyperimmunized with Super-Concentrate Phase I Pertussis Vaccine.



"A thimbleful of dosage—  
for a handful of baby"

**Small Volume Dosage:**

**2.5 cc.** concentrated gamma globulin reduces dosage volume 75%—minimizes injection trauma—permits repetition when required.

**Concentrated Potency:**

**2.5 cc.** concentrated by fractionation to contain the antibody equivalent of 25 cc. hyperimmune human serum.

**2.5 cc.** delivers consistent gamma globulin potency in constant measured doses.

**Homologous, sensitivity-free:**

**2.5 cc.** clear liquid homologous protein, Hypertussis is ready for intra-muscular injection—avoids danger of reactions and serum sensitivity.

\*Cutter Trade Name for Anti-Pertussis Serum (Human)

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or whenever coal-tar  
therapy is indicated...

**SUPERTAH** (NASON'S) "has proven as  
valuable as the black coal tar preparations"

*Swartz and Reilly, "Diagnosis and Treatment of Skin Diseases," p. 66*

SUPERTAH is WHITE — not  
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Easy to remove. Will not  
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Non-irritating and non-  
pustulant, can be left on  
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dermatitis.

Patients use SUPERTAH will-  
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**SUPERTAH** (NASON'S) is distributed ethically in 2 oz. jars  
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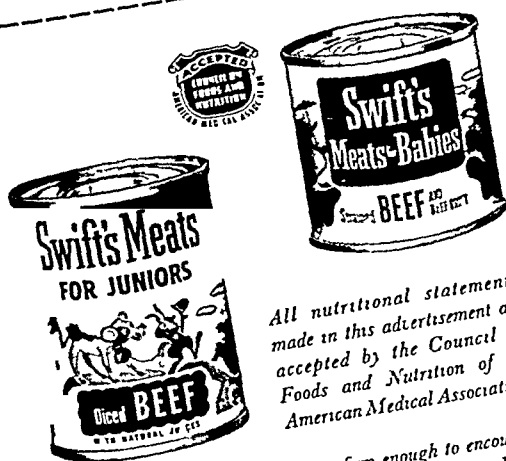
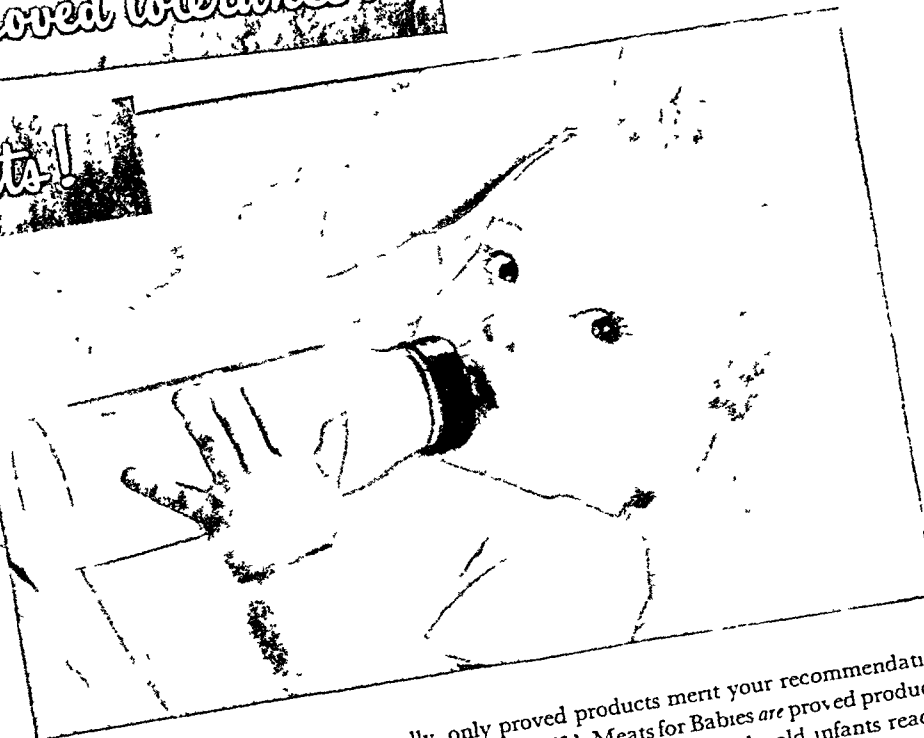
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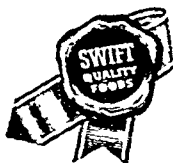
All nutritional statements made in this advertisement are accepted by the Council on Foods and Nutrition of the American Medical Association

Bite-size tender morsels of meat—firm enough to encourage chewing, aid teething. Tempting flavors in Swift's Diced Meats help prevent anorexia in the older baby and young child

Naturally, only proved products merit your recommendation for infant feeding. Swift's Meats for Babies are proved products. Proved in clinical feeding tests. Six-weeks-old infants readily accepted, tolerated and benefited from a formula supplemented with Swift's Strained Meats. These studies indicated that meat proteins are as easily digested as milk proteins at this early age. Meat-fed infants were judged in better physical condition and more satisfied than babies in the control group. Meat, a recognized hemopoietic food, helped prevent infant anemia.

Meat—a complete protein food rich in B vitamins, iron. Specially prepared, soft and smooth, Swift's Strained Meats facilitate earlier meat feeding. Expert trimming reduces fat content to a minimum. Expert cooking assures maximum retention of the valuable meat nutrients—complete, high-quality proteins for growth, natural B vitamins and iron. A complete amino acids available simultaneously—for optimum protein synthesis. Six meats—beef, lamb, pork, veal, liver, heart—provide variety and help baby establish sound eating habits. Convenient for mother—ready to heat and serve. For further information about Swift's Meats for Babies, write Swift Canadian Co. Limited, Dept. B.M., Toronto 9, Ontario.

**SWIFT**



foremost name in meats  
... first with 100% Meats for Babies

*Most Readily Absorbed\**

**FERROCHLOR**  
E.B.S.



FERROUS CHLORIDE IS THE MOST READILY ABSORBED FORM OF IRON\*

**LIQUID** Each fluid ounce provides 16 grains of ferrous chloride and 6 mg. of Vitamin B<sub>1</sub>. Supplied in one pound bottles, winchesters and gallons.

**TABLET** Each tablet represents 2½ grains of ferrous chloride combined with 1.0 mg. of Vitamin B<sub>1</sub>. Supplied in bottles of 100, 500 and 1000 tablets.

\*References on request.

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PENICILLIN

### Penicillin and Desoxyephedrine in normal saline, WILL

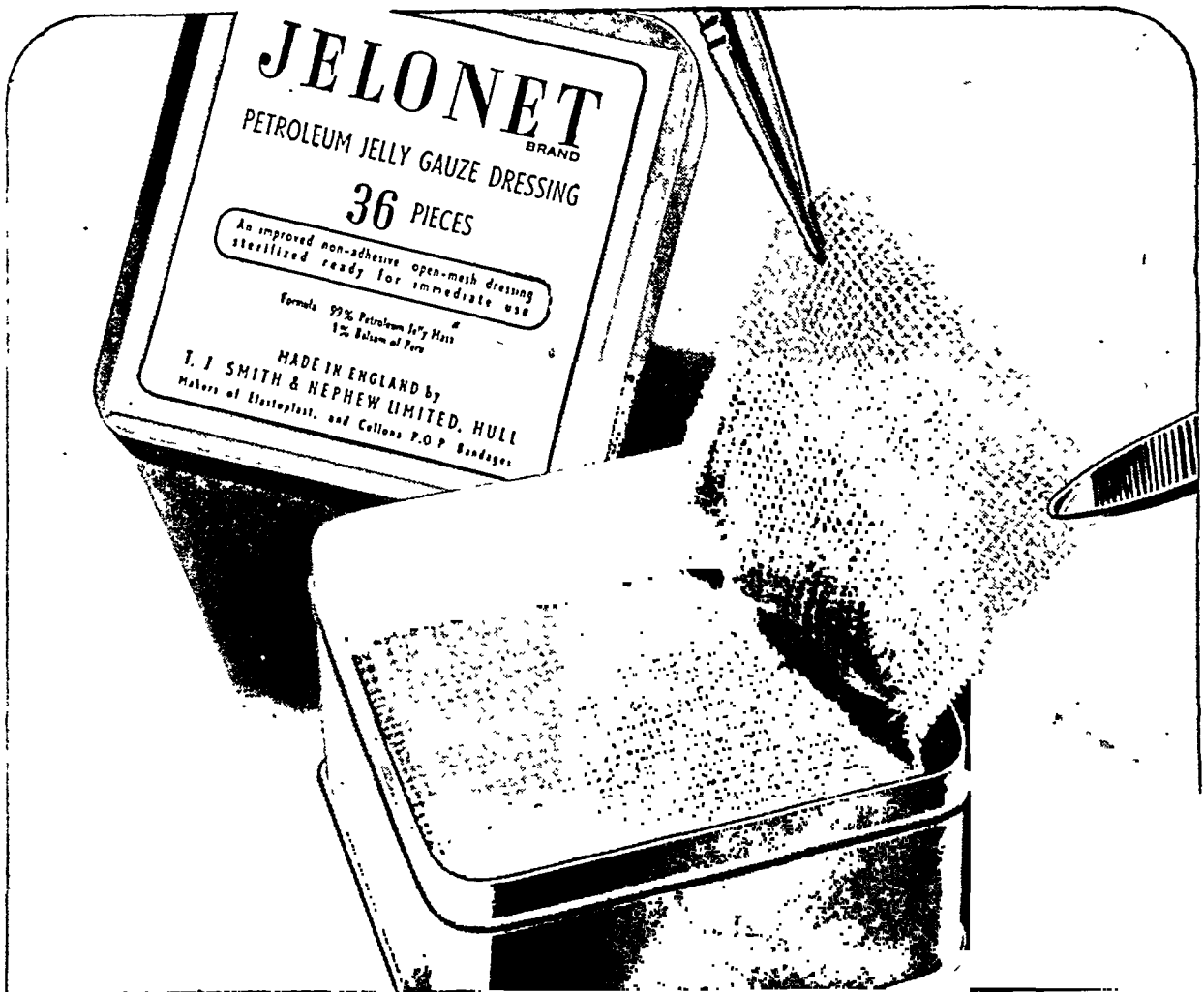
**INDICATIONS:** Rhinitis, nasal congestion, hay fever, sinusitis, common cold and other infections due to organisms known to be sensitive to penicillin

**CONTAINS:** 5,000 International Units Calcium Penicillin per mil. (cc.) and 0.125% Desoxyephedrine Hydrochloride in an isotonic normal saline solution.

**DIRECTIONS:** To be used as a nasal drop or spray.

**AVAILABLE** in 1/2 oz. dropper bottle and 2 oz. bottle without dropper.





**JELONET (TULLE GRAS)** PETROLEUM JELLY GAUZE DRESSING is an improved, non-adhesive, open mesh gauze dressing thoroughly and evenly impregnated with petroleum jelly and one per cent Balsam of Peru.

It is indicated as a dressing for skin grafts and in the treatment of wounds, burns, compound

fractures, etc. When used as a dressing for shallow wounds or skin grafts its unique 'ventilating' character provides optimum conditions for the delicate epithelium or transplanted grafts. Used to protect the skin surrounding wounds it prevents secondary dermatitis caused by irritating discharges.

*Jelonet is sterilized ready for use and is available in tins of 36 ready-cut pieces ( $3\frac{3}{4}'' \times 3\frac{3}{4}''$ ) or in tins of 8 yard continuous strips.*

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Made in England by the makers of 'Elastoplast' and 'Gypsona'  
**T. J. Smith & Nephew Ltd., Hull**

sinusitis

Antibiotic  
Control

Symptomatic  
Relief

Neo-Synephrine  
hydrochloride—the

reliable, long-acting vasoconstrictor—  
promotes aeration and aids

free drainage of mucopurulent secretions in sinusitis.  
By opening occluded ostia, it clears the way for  
effective penicillin therapy.

neo-synephrine®  
with  
CRYSTALLINE PENICILLIN

Supplied on prescription as a freshly prepared  
buffered solution containing Neo-Synephrine  
hydrochloride 0.25% and Penicillin G Sodium  
1600 units per cc., in 15 cc. bottles.

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To the premature struggling for existence, intestinal distention, colic or diarrhea may be insurmountable obstacles. Good care and good nutrition, however, offer promising prospects for life and health.

In the feeding of premature infants, 'Dexin' has proved an excellent "first carbohydrate." Because of its high dextrin content, it (1) resists fermentation by the usual intestinal organisms, (2) tends to hold gas formation, distention and diarrhea to a minimum, and (3) promotes the formation of soft, flocculent, easily digested curds.

Readily soluble in hot or cold milk, or other bland fluids, 'Dexin' brand High Dextrin Carbohydrate is well taken and retained. 'Dexin' *does* make a difference.

**'Dexin'**  
HIGH DEXTRIN CARBOHYDRATE  
BRAND

Composition—Dextrins 75% • Maltose 24% • Mineral Ash 0.25% • Moisture 0.75% • Available carbohydrate 99% • 115 calories per ounce • 6 level packed table-spoonfuls equal 1 ounce • Containers of twelve ounces and three pounds.



BURROUGHS WELLCOME & CO. (The Wellcome Foundation Ltd.) Montreal

# Why Heinz Baby Foods Are Ideal For The Babies In Your Care



Thousands of doctors and nurses in all parts of this continent rely on Heinz Baby Foods for their youngest patients. These high-quality foods merit your recommendation, too, for three outstanding reasons:

1. *Fine Flavour*—Heinz selects only fresh, juicy vegetables—only ripe, sweet fruits—only tender high-grade meats, then cooks them in such a way as to retain the minerals and other nutrients in high degree.
2. *Even Texture*—Careful, painstaking methods of straining make for a smooth, soft texture all babies enjoy.
3. *Uniformity*—Heinz constantly checks for uniformity of flavour, colour and texture, so that in recommending Heinz infant foods you can be assured that your young patients will always get the same high quality in every tin.

Samples and literature for physicians on request. Write H. J. Heinz Company of Canada Ltd., 120 Dupont St., Toronto 1.

## Heinz Baby Foods

### HEINZ

EST'D 1869

### BABY FOODS

57 VARIETIES

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SOUPS • VEGETABLES • MEAT PRODUCTS  
FRUITS • PUDDINGS • DESSERTS



In the Procter & Gamble Skin Research Laboratory: Using the Beckman Meter to determine how pH of skin is influenced by the use of soap.

## The Eyes that Watch this Instrument are really Watching over Baby's Sensitive Skin

WITH THE AID of the Beckman Meter and other precision instruments, continual studies are made at the Procter & Gamble Skin Research Laboratory. In this way, a scientific basis is provided for selecting the ingredients of Ivory Soap and determining its manufacturing formula.

Then, to complete the cycle of vigilance, the P & G factory laboratories submit Ivory to 216 separate control tests while it is being made . . . to make sure, scientifically, that every cake of Ivory meets the high standards set by research findings.

Thus, expert scientists and technicians keep a constant control over Ivory's famous purity and mildness. But back of their watchfulness is a single thought . . . care of baby's tender skin. For Ivory must be pure and mild enough for babies, safe to use (as it is used, millions of times every day) on their specially sensitive skin.

★ ★ ★

Yes, scientific research and manufacturing skill work hand-in-hand for greater protection of baby's skin. Ivory Soap is gentle . . . safe!

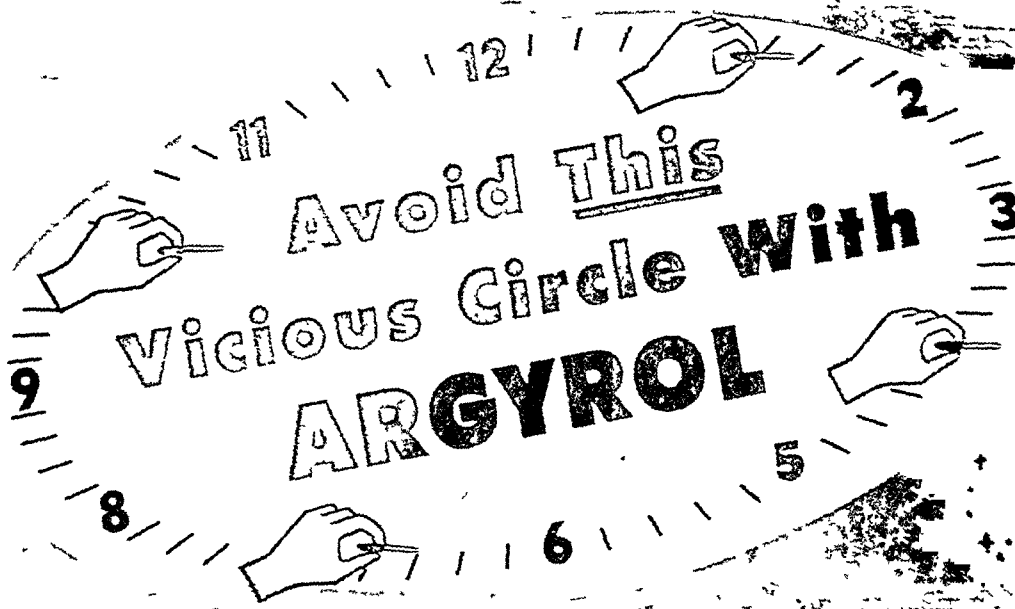


Ivory care is the most famous  
skin care in the world!



99<sup>44</sup>/<sub>100</sub> % PURE  
IT FLOATS  
MADE IN CANADA

# *In treating Para-nasal Infection*



## **econgestion Without Rebound**

It becomes increasingly evident that the compensatory congestion following use of many vasoconstrictors is creating the seeming necessity for repeated use—thus creating the vicious circle which leads to Rhinitis Medicamentosa.

This undesirable result is avoided by following the ARGYROL Technique, which attains decongestion *without rebound*, thus more readily restoring normal function.

### **The Argyrol Technique\***

1. The nasal meatus . . . by 20 per cent ARGYROL instillations through the nasolacrimal duct.
2. The nasal passages . . . with 10 per cent ARGYROL solution in drops.
3. The nasal cavities . . . with 10 per cent ARGYROL by nasal tamponage.

### **Its 3-Fold Effect\***

1. Decongests without irritation to the membrane and without ciliary injury.
2. Definitely bacteriostatic, yet non-toxic tissue.
3. Cleanses and stimulates secretion, thereby enhancing Nature's own first line defense.

\*References on request



**ARGYROL** *the Medication of Choice*  
*in treating Para-nasal Infection*

Made only by the **A. C. BARNES COMPANY LIMITED, STE. THÉRÈS**

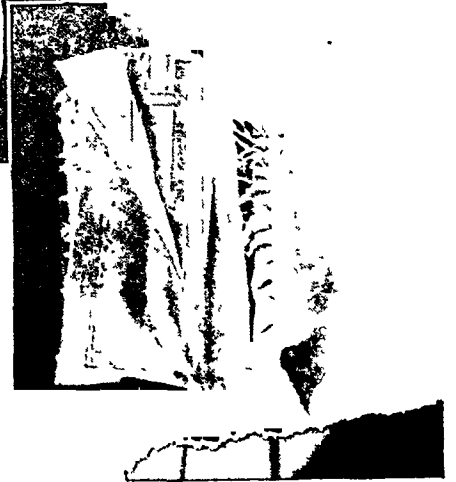
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## CAMP SUPPORTS *for the* LOW BACK

Discussing the general treatment of low back pain in a recent article, an orthopedic surgeon\* comments on supports (among other items) as follows: "The second remedy tried by time is further rest provided by support after the patient gets out of bed. Various corsets, braces, and casts have been used and the one criterion is that they be well fitted and do the work intended."



For the Intermediate-to-Stocky Type of Build



Story: Using the Beckman by the use of soap.

The Camp lumbosacral support (illustrated) fits down over the gluteal region and restricts the motion of the pelvic and lumbar joints. The lower adjustment following about the major portion of the pelvic girdle is a prime factor in relieving the weight-bearing joints of the lower spine.

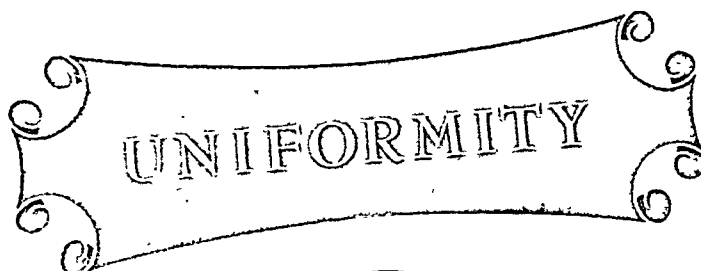
The support lends itself readily to reinforcement with the Camp spinal brace (illustrated). The brace is made of spring steel and comes in varying lengths — twelve, fourteen, sixteen, and eighteen inch lengths. Aluminum uprights and pads are also provided by Camp for reinforcement of orthopedic supports.

Camp fitters are trained and supervised by nurses and instructors.

\*Hugh T. Jones, M.D.

*Low Back Pain from the Orthopedic Standpoint*  
*California Medicine*  
*Vol. 68, February, 1948*

S. H. CAMP and COMPANY OF CANADA, LTD.  
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One of the world's finest drug plants is devoted solely to the making of Aspirin. Nothing you prescribe is more carefully made. To make sure that Aspirin is always uniform in quality, more than seventy tests and inspections are employed in its manufacture. Behind these tests and inspections are forty-seven years of experience in making the analgesic for home use . . . Aspirin.

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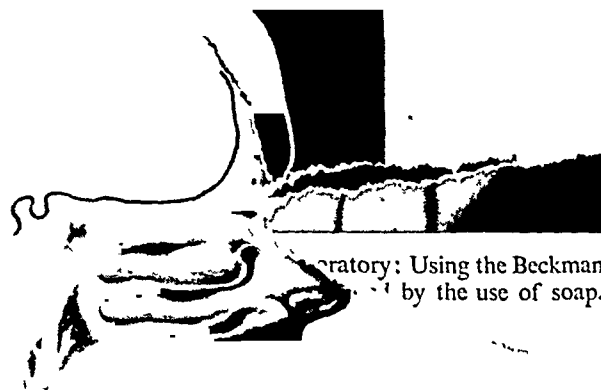


# Local penicillin reduced intranasal bacteria 99%

Proceedings of the Society of American Bacteriologists,  
47th general meeting, May 13-17, 1947

A series of patients was treated intranasally  
with local penicillin, 500 *International Units per cc.*,  
for 5 consecutive days. At the end of this time,  
the bacteria count was reduced from an average  
of 7.363 per cc. of nasal washings to the  
amazingly low average of 42.

In Par-Pen you have a preparation that combines  
the potent antibacterial action of penicillin,  
500 *International Units per cc.*, with the rapid and  
prolonged vasoconstriction of 'Paredrine Aqueous'.



# Par-Pen

**the penicillin-vasoconstrictor combination for intranasal use**

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